MAY 31 1916

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

Vol. V MAY, 1916 No. 5

PUBLISHED MONTHLY BY
AMERICAN PHARMACEUTICAL ASSOCIATION

Office of Publication: Bourse Building, Philadelphia, Pa.
Annual Subscription, $4.00; Single Numbers, 35 Cents

Entered as Second-class Matter January 28, 1916, at the Post Office at Philadelphia, under the Act of March 3, 1879.

NEXT ANNUAL CONVENTION, ATLANTIC CITY, SEPTEMBER 5—9, 1916
American Conference of Pharmaceutical Faculties and National Association Boards of Pharmacy convene at Philadelphia, August 31, September 1–2, 1916

The Fairchild Culture
Of the Bacillus Bulgaricus

Effective in every clinical application of the bacillus Bulgaricus. Particulars, clinical data, etc., upon request.

Vials of approximately 7 c.c. each

Boxes of 6 vials, $3.75 per dozen
Boxes of 20 vials, $10.00 per dozen

FAIRCHILD BROS. & FOSTER
NEW YORK

Fill the ℞ with MERCK'S

Specify
MILLIKEN
PHARMACEUTICALS

See Our Advertisement on Page vii

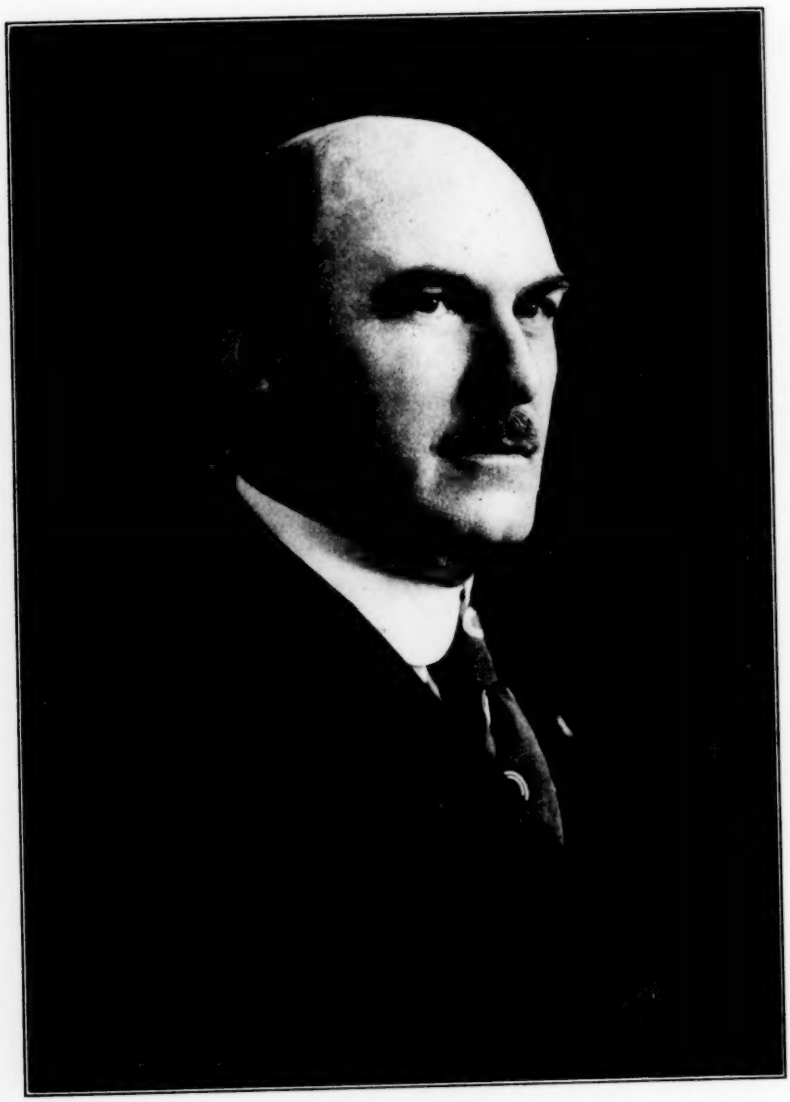
JOHN T. MILLIKEN & CO., ST. LOUIS

DRUG STORES (Snaps) for sale and positions in all states. Physicians, Veterinarians, Dentists furnished for locations.
F. V. KNIEST, R.P., Omaha, Neb. Est. 1904.

☞ *Table of Contents of this issue will be found on the last page (XIV).*

HENRY C. CHRISTENSEN

Secretary National Association of Boards of Pharmacy.



H. C. CHRISTENSEN

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. V MAY, 1916 NO. 5

HENRY C. CHRISTENSEN.

A feature of the San Francisco convention, which will be judged of great importance as the work progresses, was the harmonious and fruitful joint meeting of the Faculties and Boards—a meeting which brought about a measurably closer relation and coöperation between these national bodies and which thereby promises much for the establishment of uniform standards for the valuation of pharmaceutical training throughout the nation. For the success of this joint meeting, a large share of credit is accorded to the tactful and patient perseverance of the secretary of the National Association of Boards of Pharmacy, Mr. H. C. Christensen.

Mr. Christensen's knowledge of board examinations rests on a firm foundation. Following his graduation from the Northwestern University School of Pharmacy in 1893, where he won the Gilpin Langdon prize for the best preparations made in the laboratory course in pharmacy, Mr. Christensen was engaged in the retail drug business in Chicago as manager or owner for seventeen years, and in 1907 was appointed a member of the Illinois Board of Pharmacy. His intense interest in his new duties led to the elaboration of the practical examination in dispensing, to which he gave much time and effort and which became a noteworthy part of the Illinois examination.

In 1911 he was reappointed on the board of pharmacy following the recommendation of the Illinois Pharmaceutical Association. His first insight into an organization of state boards was gained in the same year, when the Interstate Association of Boards of Pharmacy was formed. Mr. Christensen's activity in this smaller body led to his appointment as chairman of the Advisory Examination Committee of the National Association of Boards of Pharmacy in 1913, and a year later to his election as secretary of that Association, a position which now demands all his time.

Mr. Christensen's ambition, for which he has worked untiringly, is to secure universal reciprocal registration and, as a foundation for this, a higher and more uniform standard for examinations, together with higher educational requirements preliminary to the professional training.

Mr. Christensen is a member of the Illinois Pharmaceutical Association and the Chicago Branch of the American Pharmaceutical Association. He is also Chairman of Joint Examination Committee of the Boards and Faculties.

WM. B. DAY.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

CONDITIONS NOW, AND AFTER PEACE IS DECLARED.

NO retail business has been more disadvantageously affected by higher costs than the drug business, one of the reasons being that there have been comparatively few changes in retail selling prices for many years. A few items, perhaps, have in the past fluctuated sufficiently to make a change in selling prices necessary, but now nearly every drug item is largely affected.

The very unusual situation obtains that a prescription filled to-day may cost decidedly more to-morrow, and in justice to themselves pharmacists are compelled to exact their usual profit. Nearly everywhere publicity has been given, so the public is informed.

The high prices have tempted sophistication, substitution and adulteration, and in some instances such fraudulent practices have been carried so far as counterfeiting the labels of reputable manufacturers and thus fleecing the unwary druggist. This teaches the lesson that retailers themselves impress upon their patrons, namely, that reputation is one of the valuable assets of pharmacists. Attractive prices have in some instances blinded the precaution of retailers, which they should exercise in buying, for the tests which are provided by the Pharmacopœia are sufficient for detecting the gross substitution and adulteration resorted to. Hence, it must be admitted that in some of the cases which have come to public notice, the purchasers were not altogether blameless.

No one need be told that conditions now are abnormal, and it is for this reason that every citizen is interested in what normal conditions will be after peace is declared; certainly they will not be the same as those that obtained before the war—the readjustment in many lines will present serious problems.

As far as the drug business is concerned, there should be a possibility of profiting by experience; it is probably advisable to be judicious in buying. Speculation has entered largely into the advances of prices, for many articles are really not now affected by demand or lack of supply; however, the fact remains that there is an interrelation between many crudes and manufactured products; limited uses for some things have become extensive and we have found that certain drugs have a far larger application in other lines than ours. To be more specific, the various substances that enter into the manufacture of explosives are quite generally known, so that the high price of glycerin, sulphuric and nitric acids creates no surprise; but these and the constituents for production are also required for other manufacturing, therefore numerous articles are affected in price. Castor oil is used extensively in the leather industries and also as a necessary lubricant for aeroplanes; by far the larger amount of licorice is consumed by the tobacco

industries, etc. So the links of the chain that have compelled higher prices become evident. With all of that the potential factor is, that the United States is being called upon to supply the world, which sends prices skyward, and in this way we are paying part of the cost of war in Europe, though through other sources than ours the money is coming back.

In the sections of the country where war supplies are manufactured, the cost of labor has advanced, affecting every other line; when peace comes there must be a readjustment and our further foreign trade will largely depend on the attitude of labor, for Europe will be trying to recapture the trade our manufacturers have won. As Frank A. Vanderlip says, we certainly have a better chance to connect up our industries with world trade and world development than ever before, but the fact that one man has a better chance than another, or one nation has greater natural advantages than another, has never yet determined the result of competitive struggle. We cannot rest on a level of cost of production far above the rest of the world and hold our place in the sun.

But to come back to that which concerns us more directly: As far as possible we should establish an American materia medica. It is not implied that proven remedies should be discarded, but heretofore we have depended on Europe's research work, with the result that the medicinal products were manufactured there. We have further protected them by American patents, to our own disadvantage. The recipient of such protection should be called upon to manufacture in this country, if he would enjoy special privileges. Under no circumstances should it be possible to charge us one dollar for what an adjoining country pays only twenty cents. Another condition that may obtain is that in order to discourage American manufacturers, who contend with higher labor cost, European manufacturers may unload large stocks here at low prices.

We have always suffered from high cost of waste, and if our experience will point the way to thrift we will be the gainers. Every state should look into its natural resources and waste products. Plants yielding drugs that we have been importing grow and die, while if the farmers knew them, they might be collected. Many manufacturing establishments have waste material that ought to be converted into useful products.

In every locality meetings of physicians and pharmacists should be held for discussion of the present status of the drug market. The physicians have become wedded to certain therapeutic agents that could readily be displaced; for example, sodium salts for those of potassium, the use of galenicals for active constituents, etc. Physicians should acquaint themselves with the Pharmacopœia and National Formulary and then decide what, in their opinion, they must have, and thereafter pharmacists can offer suggestions for consideration. A careful survey and coöperative study will do much toward relieving the present trying situation and prepare us for utilizing coming opportunities. E. G. E.

PROPAGANDA OF PHARMACY IN THE STORE.

THERE should be a time for inspection and perspection for pharmacists. They should sometimes step on the outside and look in. Pharmacy has a mission, but its potency is lessened when the armamentarium is obscured by the multiplicity and diversity of stock; a cause is often weakened by an explanation and injured by an apology.

Side-lines are essential in the modern drug store for increasing the volume of business and profits, but the pharmacy should be kept separated from that part of the stock in the store. Let it be a pharmacy in a drug store, if nothing more is possible. The public receives a wrong impression of what pharmacy means when the sundry assortment is displayed and arranged with materia medica.

Gifts and sundry items are articles of merchandise that can be sold advantageously in a drug store, should be advertised and displayed according to modern store methods whereby such sales are promoted, but let pharmacy have an opportunity to represent itself without detracting from its mission.

We should be honest with ourselves and with the public: no success was ever permanent that required the obscuring of something, that compelled an apology. If, in order to preserve the success of those engaged in the drug business, merchandizing is essential, let us be frank and admit it; certainly business conducted on the high plane of modern ideas is honorable and not something to be ashamed of. Make-believe is harmful, whatever its association may be.

Another thought: How can sellers of medicines excuse themselves when they are purveyors of harmful preparations, of those that are not what they purport to be, and the sales of which are established by high-sounding and persuasive argument, but not applicable in fact to the preparation advertised? The encouragement of such traffic cannot contribute a service which will establish pharmacy on a firmer foundation.

We do not advocate counter-prescribing, but just for the sake of thoughtful consideration, would the public be better served or not, if, instead of some of the preparations referred to, *known* to be either inefficient or dependent for effect on the stimulant contained therein alone, they would be persuaded to purchase a preparation made by the pharmacist, and not of the former type?

As a matter of fact, would not such action be the lesser offence, and would this not finally educate the public to consult physicians when necessary, even though for minor ailments they continued to purchase the remedies prepared by the pharmacists? Would not medicine and the public benefit thereby?

Of course, here comes the old familiar question: Am I my brother's keeper? Counter-prescribing is often looked upon from a very restricted viewpoint—the sales of proprietary medicines constitute, at least occasionally, a like offence as the suggestion of simple remedies prepared in the pharmacy.

Aside from the thought relative to what portends the best service, this writing is intended to stimulate a deeper interest, if possible, in applying the work of

pharmacists and physicians who seek to devise standards for drugs and representative formulas for preparations of them.

In a way, physicians have similar problems. Take the patient who expects a prescription but really needs no medicine. While from one point of view, the physician should so advise the patient, in many instances this would create dissatisfaction. If a sensible person were told that the medicine would have no effect on the *malade imaginaire* except through the mind, he would doubtless retort, "What sort of a fool do you think I am?" It is only because the real intentions are concealed that the patient in confidence takes the medicine. But patients are not born with the belief that every symptom must be counteracted by a drug—they acquire that belief by persuasion. So, after all, this is a form of quackery.

The public will gradually become educated along both lines, and during the meantime it is certainly advisable to act according to moral dictates and rational practicability and with progressive forethought. The disclosures after the Federal Food and Drugs Act became effective are not too remote for reference; the very fact that harmful and misleading preparations were sold did not give the public greater confidence in those who knowingly, or otherwise, promoted such sales.

This, then, is a call for bringing into more extended use the preparations of the Pharmacopœia and National Formulary. We are all interested in developments that will elevate pharmacy and enable pharmacists to render better service; so even these suggestions may be helpful if, when applied, they will make pharmacists worth more to themselves and worth more to others. E. G. E.

THE ORIGINAL CERTIFICATE OF MEMBERSHIP OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

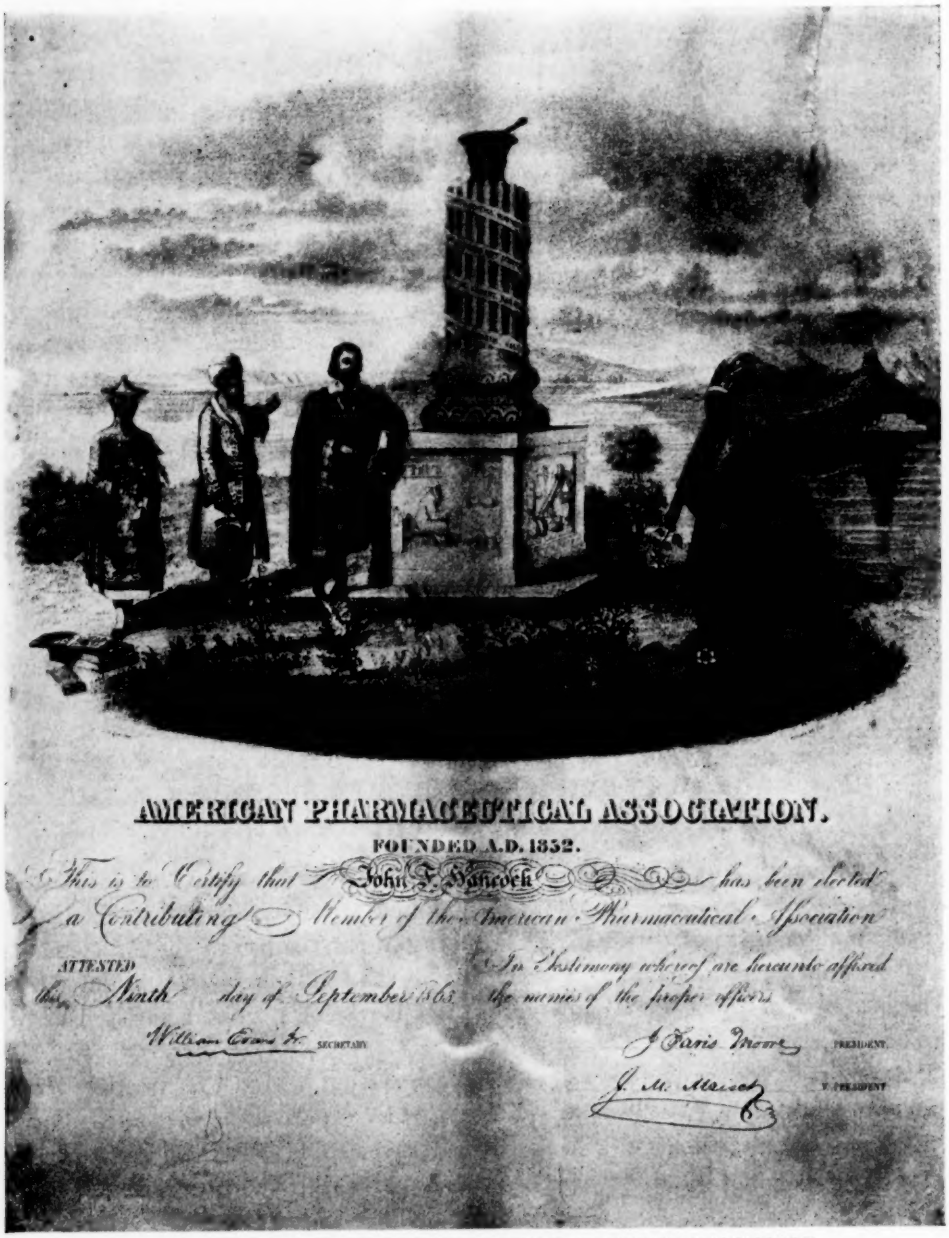
At the meeting of the American Pharmaceutical Association, held in Boston August 24 to 26, 1853, a committee was appointed "to inquire into the expediency of obtaining a form of certificate of membership for the use of the Association, with such insignia and devices, or otherwise, as shall in their opinion be suitable." The members of this committee were Andrew Geyer of Boston, Charles Ellis of Philadelphia, and Joseph Laidley of Richmond.

A report of the committee was made at the session held in Cincinnati in 1854, and the Association gave instructions for further report to be presented at the annual meeting held in New York in 1855. In the meantime, the chairman, Mr. Geyer, had died and the report was made by Charles Ellis, and thereafter William Procter, Jr., was named a member of the committee in place of the deceased, and John Meakim of New York was added to the committee.

The final report and presentation of certificate were made at the fifth annual meeting, held in Baltimore, September, 1856, and therein the certificate was described. We are using the words of the report for the description and presenting a

reduced cut of the certificate of Dr. John F. Hancock, Baltimore, chairman of the William Procter, Jr., Monument Committee.

" Near the centre of the picture is a monument in honor of Pharmacy, consisting


AMERICAN PHARMACEUTICAL ASSOCIATION.
FOUNDED A.D. 1852.
This is to Certify that John F. Hancock has been elected
a Contributing Member of the American Pharmaceutical Association
In Testimony whereof we hereunto affixed
ATTESTED
this Ninth day of September 1865 the names of the proper officers
William Evans Jr. SECRETARY
J. Faris Moore PRESIDENT
J. M. Maisch V. PRESIDENT

CERTIFICATE OF MEMBERSHIP OF JOHN F. HANCOCK, BALTIMORE

of a square panelled base, from which rises a fluted column, surmounted by the mortar and pestle. Encircling the shaft of the column is a winding scroll, on which appear the names of Galen, Geber, Avicenoa, Bazil Valentine, Lemery,

Baumé, Scheele, Davy, Sertuerner, Robiquet, Pereira and Liebig. One of the panels represents an alchemist at his furnace, the other exhibits a series of pharmaceutical apparatus, the balance, gas burners, Liebig's condenser, graduated measure, 1000-grain bottle, etc. There are four human figures: a European, a Turk, a Chinese, and an American Indian. The European is leaning gracefully with his left arm on the monument, with a book (the Pharmacopœia) in his left hand, whilst his index finger points toward the Structure. The Turk holds in his right hand the Poppy and Acacia vera, whilst his left is extended toward the horizon, where a group of pyramids symbolizes the East. The Chinese holds in his right hand the Laurus camphora and Piper nigrum, whilst at his feet is a pile of Chinese books, towards which he points. The American Indian, on the right of the picture, is represented as in the act of speaking, with a branch of cinchona in his right hand, and his left extended toward the south, indicated in the horizon by a volcano (Cotopaxi) in the Andes, and by a Mexican teocalli. Before him, on the ground, is a rude wicker basket containing a variety of plants from Southern America, among which may be recognized ipecacuanha, cinchona, quassia, angustura, copaiba, guaiacum, canella, sarsaparilla and jalap, whilst around him, growing from the soil, are several well-known North American plants, as senega, spigelia, sanguinaria, podophyllum, etc.

The explanation of the picture is as follows: The European represents the scientific pharmacy of all countries; every region contributes to its materia medica; and his scientific art, illustrated by the illustrious individuals named on the column, has votaries in every country where European civilization has extended, without reference to nationality. The Arabian symbolizes that imperfect empyrical pharmacy that pertains to Mohammedan countries. The Chinaman signifies that ultra-oriental pharmacy now practised in India, China, and Japan, embraced in the volumes before him, and which he boasts as antedating the earliest records of European science. The Indian is introduced to Americanize the picture. He is represented as saying, however valuable are the plants growing around him, and with the virtues of which he is familiar, those given by the Great Spirit to his aboriginal brethren of tropical America, of which the basket contains a sample, are far more important and useful.

One of the reasons for discontinuing this certificate was the use of the design by a proprietary medicine manufacturer.

WOMEN'S SECTION, AMERICAN PHARMACEUTICAL ASSOCIATION.*

PROCEEDINGS OF THE THIRD ANNUAL CONVENTION HELD IN SAN FRANCISCO, CALIFORNIA, AUGUST, 1915.

SECOND SESSION.

The second session of the Women's Section was held in the Palm Room of the Bellevue Hotel on Thursday, August 12, at 3 P.M.

The meeting was called to order by the President.

The principal feature of the afternoon program was a symposium on "What the Women's Section Can Do," to which the following women contributed: Mrs. Gray, Mrs. Fennel, Mrs. Ruddiman, Mrs. Kenaston, and Miss Creighton.

SYMPOSIUM: WHAT THE WOMEN'S SECTION CAN DO.

Mrs. M. M. Gray: I have two things in mind: First, keep up the agitation for women members. I feel certain that there are a great many women pharmacists all over the United States that have not yet been reached by our Membership Committee, and there are a few women graduates each year. Second, I have thought of membership in the American Pharmaceutical Association as a prize to be offered by the Women's Section to women graduates from recognized colleges of pharmacy, these to be given for proficiency in college work. If several prizes of this nature could be given each year, it would be the means of interesting a much larger number of women in the American Pharmaceutical Association and the Women's Section.

Mrs. C. J. Fennel: Being a German by birth and conversant with German pharmacy and pharmacists, I believe I am in a position to discriminate between German and American pharmacists.

The German pharmacist occupies a very high professional and social standing. In my opinion, American pharmacists—and by that I mean the great mass of American pharmacists, and as a rule, not members of the American Pharmaceutical Association—enjoy no professional standing and socially occupy no exalted position. There must be a definite reason for such a condition, especially when only about five percent of the pharmacists of this country are members of the only association that stands for, and has always aimed to maintain, the highest ideals of American pharmacy, the American Pharmaceutical Association.

I believe education and business conditions to be the two main causes of this state of affairs. Overcrowding of stores forces the pharmacist to become a merchant, and so puts him in the merchant class. The main reason is the low standard of admission to some of our colleges, and, too, the fact that too many are permitted to make state examinations without college education and are given degrees they have not earned. I am sure when the pharmacist will accept *only* college graduates as clerks and assistants conditions will change gradually, and when the pharmacy of to-day has become the real *drug* store as it is in Germany, then will the American pharmacist receive his due recognition.

Mrs. E. A. Ruddiman: One of the best things the Women's Section can do is to take up the matter of shorter hours for druggists in the two forms of decreasing the number of hours of work daily and also partial closing on Sunday, emphasizing the fact that pharmacists themselves should regulate this matter and see to it that any laws passed are of a kind to help them in their business.

I would suggest that a central committee be appointed whose duty it shall be to prepare articles on this subject for publication in the trade journals, in magazines, and in the daily

*Continued from p. 365, April issue.

papers of the country. They may use material from any source and written by any person. The articles thus prepared should be sent to the different sections of the country for dissemination by the local members. The committee should coöperate with the women's sections of the state associations and the other national associations. They should be persistent in their efforts and not be deterred by lack of results. All of this is for the purpose of educating the members of the profession, physicians, and the public at large in the necessity for this reform and the best way to accomplish it.

In this Women's Section I am sure it is not necessary to call attention to the fact that by uniting and by continued effort women have accomplished a great deal toward a better life for the community.

Mrs. H. R. Kenaston:

South Dakota sends this beautiful thought to carry away;
It may lighten our burdens and brighten our day;
Pharmaceutical study is so full of beautiful things,
Let us gather them in and equip them with wings;
Thus the knowledge we gain may rebound to another,
And help upward and onward some sister or brother.

The ladies who, by their invitation, have permitted me to participate in this symposium of ideas as to what the Women's Section can do have conferred upon me an honor which has given me great pleasure. To have a share in the deliberations of this distinguished body is a distinction any one should be proud to accept.

The creation of the Women's Section by the American Pharmaceutical Association at its meeting in Denver in 1912 was the expression of an organized effort on the part of the pharmaceutical profession of this country to recognize the place women are attaining in the profession. As a Section of this great national scientific body, more will be accomplished for the women in the profession than they could hope to attain by separate organizations of women, because their efforts will be sustained by the influence of the American Pharmaceutical Association and the prestige accorded that body as a result of its sixty-two years of excellent work.

Women pharmacists should all be active members of their state and national associations, and to this end I would heartily endorse the commendable plans of the Special Sub-Committee on Women Members and their action when they appointed a chairman in each state with duties assigned to interest the women members of their respective state associations in membership in the American Pharmaceutical Association.

Since service is the price we pay for the benefits of membership, each member should be designated some service which she is to render the Women's Section. True, she can solicit membership, create enthusiasm, etc., but for what? For the benefits each is to receive through the service she performs.

The creation of a Committee on Botany and Medicinal Plants would open a line of service in which both professional and non-professional women could effectively work together, and that along professional lines both elevating and educational. Combined with progressive thought and ideas, make the preliminary plan to investigate the honest therapeutic value of plant life, the possibilities of improvement in drug value of the drug plants, as well as the economic value to the nation which would result if weeds that are used in medicine were collected and preserved. How many useful and beautiful phases of economic value are represented in the despised weeds surrounding us, if we only look for them! The Creator has told us many things, but much still awaits the investigator before His great plan of the plant life is wholly utilized for the benefit of His people.

The women of to-day have reason to rejoice as they pause upon the threshold of the future and with confidence and unfailing trust comprehend the greatness of women's organizations and the possibilities for manifold benefits to womankind as represented in our Section.

A great benefit would result to pharmacy in general and to women in particular if the Women's Section of the American Pharmaceutical Association could bring before the young women, at the time in their life when they are deciding the very important question of their life-work, the comparative advantages of engaging in the profession of pharmacy.

Here is the opportunity for service in the vital interests of the problem which our young women must solve. We, as women, will render the greatest service when we realize the part assigned to us in this critical period of decision, and by a plan worked out by the deliberations of the Women's Section during the San Francisco meeting, be prepared to give inspiration and encouragement to the young women of our high schools and universities, and to do all in our power to diffuse favorable public sentiment toward young women desiring to enter the profession of pharmacy. To this end, the members of our Section should emphasize the right and capabilities of women to engage in the profession of pharmacy as a means of earning their livelihood; to unite the women now engaged in pharmacy, in any and all of its phases, for mutual assistance and protection; to coöperate in the promotion of the general progress of pharmacy.

Miss Mary L. Creighton: While it is reputed to be an easy matter to say little in many words, to reverse the case, in compliance with our Secretary's suggestion is far more difficult.

In attempting to answer the query, "What can the Women's Section do?" the thought presents itself, why do not women take more interest in the increased efficiency of our schools and colleges of pharmacy? These institutions, as a rule, are controlled exclusively by men, who, with very few exceptions, constitute the entire teaching force as well as the official boards, and who fix the courses of study, laboratory equipment and practice, etc., to suit their ideas of what is required for proper instruction in the various branches of a pharmaceutical course —a condition which is recognized as being largely, if not wholly, due to the difficulty of securing competent women to fill such important positions.

Experience shows that in connection with public school work women not only take a lively interest in the welfare of the pupils, but that a large majority of public school teachers are women. The conditions are not radically different in technical schools, and there is certainly an opportunity here for wisely-directed effort by the Women's Section toward raising the standard of pharmaceutical education:

First, by increasing the entrance requirements, so that the unfit will be prevented from entering upon a career for which they are unprepared and in which they can have but small hope of success; and

Second, by the adoption of uniform courses of study in all the teaching institutions of the profession—with accompanying laboratory training of approved scope and character, as proposed by the A. Ph. A. Syllabus.

With proper preliminary education and the additional training received in a first-class college of pharmacy, the student acquires the ability to apply the knowledge thus gained when he takes up the actual duties of the pharmacy. His information will be in usable form, so that he is able to draw general conclusions from particular facts. In other words, his work as a student will have so developed his reasoning powers that he will not be compelled to stop and consult authorities when some prescription difficulty arises.

Unfortunately there are many of whom the above cannot be said. They are lacking in the initiative which would enable them to infuse sufficient energy into the performance of professional obligations to lift them from the level of those "who work from sun to sun to do what other men have done"; a habit for the cure of which the logical prescription is intelligent coöperation with their fellow pharmacists through the medium of the various pharmaceutical organizations and publications. Such coöperation will obviously be increased as more attention is paid to the proper preparation of the student, since it is a well-established fact that a liberal education broadens the outlook of the individual so that he is apt to be moderate both in the views which he maintains and in their expression. He has learned the rules of the game of life and is able successfully to apply them. In short, he is able to see the other side, a fact which goes far toward promoting harmony and community of interests professionally.

Without ideals there can be no satisfactory advancement, and in order to gauge progress it is essential to work with a definite purpose in view. Opportunity, "master of human destinies," knocks at our gate. As members of the American Pharmaceutical Association the Women's Section represents *our opportunity,* no matter what the particular form in which each of us may recognize it.

At this point President Caswell A. Mayo, of the American Pharmaceutical Association, was introduced and spoke as follows:

If you will pardon the interruption, ladies, I wish to apologize when I failed to appear earlier. We have only one President, and I have no astral body, otherwise I would have my astral body remain here. If I had my choice, I would have joined the Women's Section first.

At the last meeting of the Section, at Detroit, the President mentioned with regret that there was no gavel, to learn which I was rather surprised, because I thought the ladies were absolutely orderly and did not require being called to order, but since it has developed it is necessary to provide some means of calling ladies to order, and since we are in California at the wonderful Exposition they have created, I thought it would be rather interesting, possibly, if the ladies could carry back with them a souvenir, and so, after a great sacrifice of time on the part of Mrs. Phillip, we have obtained this orange-wood gavel.

It would be entirely appropriate that there should be something to indicate the very high esteem in which the Women's Section is held by the Association at large. I only wish I could contribute something of serious value to your deliberations.

You are well aware of the fact that since the division of the work of the Association into sections, it is almost impossible for any one present here to cover all and give attention to each.

I wish you every success in your work, and trust that this gavel will be used but little, so it may last for many generations. I have, therefore, great pleasure in presenting this gavel, and trust that you may wield it lightly and have no trouble in keeping the ladies in order. (Applause.)

The President: Mr. President Mayo, I take pleasure in thanking you from the bottom of my heart for this gavel, and to receive it gives me great pleasure.

After the departure of President Mayo the reading of the papers in the symposium was discussed.

The President: If there is one note struck more than another in all of these papers it has been that women might work for pharmaceutical courses on the part of the schools. There seems to be a lack everywhere in the lower schools of particular instruction in pharmacy, and from nearly every section of the United States they have struck the note that we might work for better courses in the lower schools. If we had nothing else to work on for the next several years, we would have plenty to do, and we might begin to investigate with the view to the proper foundation work. My greatest reason is that my son, at his majority, will likely go into the store, and I am afraid to have him go away from home for his pharmaceutical training; I am afraid of the influence, and believe those who leave home to go to college towns are in tremendous danger. Cannot we do something so that in our high schools foundation work shall be done? It has been done in some states, very well done. After that, cannot we have our university courses prepared just a little better? If we do nothing else but this in laying the foundation work for next year, it seems to me that we have something to take home.

While it seems to me that the Women's Section has not progressed, when I hear these papers I am still convinced that there is still some interest in the Women's Section of the American Pharmaceutical Association.

Mrs. Godding: We must remember we were not born until 1912. Nashville was our first meeting, Detroit was the second, and we are very, very young. There are members of the American Pharmaceutical Association—men and women alike—who do not understand why this Section was formed and what it

is to do. The women did not start it. It was the men—men who have been leaders in the Association and always worked for its best interests—who suggested this Section. Women pharmacists have a place here which we wives have not, but we are closely allied to pharmacy; we have married pharmacists, and if our husbands bring us to these meetings because of the pleasure of travel and the pleasures that come from seeing this great country of ours, is it not due that we as loyal and true wives shall help to sustain our husbands and give to this Section the support that we must give it if it shall be a success? It is yet but a child. It is the acorn from which the great oak will grow, and I feel that we need to disseminate knowledge of the objects and aims of this Section.

Mrs. Phillip: Mrs. President, when you asked me if I would speak of our California association, I promised to tell what the women have done here and what I know the national association wants them to do. Many auxiliaries have been started, usually in the city where the state convention was held. I have been watching the progress in this state for the last four years, and I will say that the men who attend regularly and who constitute the largest part of the attendance are the men whose wives belong to the auxiliary. Another thing that has been done is the Sunday closing. On our side of the Bay we close on Sunday from 1 to 6. We tried in various ways to get the proprietors to come together and discuss the benefits to be derived from having a day off. We did not succeed wholly. Then the wives decided they wanted their husbands one day when they would not be thinking, "What on earth is that clerk doing while I am gone?" and influenced them to close the store for at least a part of the day, and the result is that some of the stores are closed all day and some from 1 to 6, and I would like to say that every wife is worth what her husband loses in business Sunday afternoon if he closes that store. In our section we do not find it necessary that one store keep open each Sunday. Sunday afternoon closing has taught the people to rest and to prepare for Sunday on Saturday, and the morning trade on Sunday is ruined. There is, of course, some Sunday evening business. Emergency calls are not taken to drug stores as they once were. The wives have done another thing. By getting together they have become interested in their husbands' interests and are able to vary the monotony of the long store hours with retailing the conversation and happenings learned among the women.

The Chair then called for the paper by Mrs. J. M. Bladen on "The Sphere of the Druggist's Wife as Affecting Public Health"; "Women in Pharmacy," by Miss Ott, and "The Woman in Her Own Pharmacy," by Miss Frick.

In discussing Mrs. Bladen's paper the President asked for remarks.

Mrs. Howard: I think that possibly the thought of doing something to bring about a general interest in the state organizations in reference to this national movement would be advisable. It is almost impossible to create an interest in the national body unless there is some subdivision of states. If each state had a subdivision of this Section under the supervision of a vice-president in each state, and these subdivisions were used in the manner that political organizations are used, it seems to me it would be the best way to create a fuller and greater interest. The Exposition has detracted from the interest of this meeting, but at the same time there are many women in this national body who do not care for and are not interested in the Women's Section. I believe, from my experience in other club work, that the basis on which to work is the subdivisions of state organizations.

The President: Mrs. Howard, has it occurred to you that, relative to the state organizations, all the members of the state are not members of the American Pharmaceutical Association?. If we create interest among women whose hus-

bands are not members of the American Pharmaceutical Association, how can we proceed?

Mrs. Howard: I would lobby among the men to join the American Pharmaceutical Association, and then I would lobby among the women to attend the American Pharmaceutical Association. I believe in this world that nothing will come to us without going after it.

The President: In my state—Utah—we have but five members of the American Pharmaceutical Association. We have a fine organization of women who attend the state convention and who would be perfectly easy to get into the national body, provided the men were members.

Mrs. Howard: If you have five men in Utah who are members of the American Pharmaceutical Association and who attend the state convention, those five wives should be interested in the Women's Section. If you get only one from each state you have a larger circle than you have to-day.

The Report of the Committee on Resolutions was read as follows and accepted.

WHEREAS, The long hours of service required of the proprietors and assistants in most of the pharmacies of the United States are a severe hardship and unnecessary burden, not only for those who are subjected to them, but also for their families; and

WHEREAS, A reform of this inveterate evil, in order to be effective, must come from the ranks of the profession; therefore,

Resolved, That we, Women's Section of the American Pharmaceutical Association, respectfully submit this subject to the Association for their earnest consideration, and urge the officers, Council, and members to promulgate a plan for betterment according to their wisdom, and institute a propaganda over the whole United States to bring about better conditions in this respect.

Resolved, That we earnestly request the Council to advocate and recommend the closing of pharmacies on Sundays, or part of Sundays, and encourage every effort and movement in this direction, believing that in small cities a concerted action will bring about the desired result, while in larger cities the division into a number of sections, each possibly requiring separate action, may be necessary.

Resolved, That the Secretary of this Section be instructed to forward a copy of these resolutions to the sections or committees of women in other pharmaceutical associations, with the request to coöperate with us in this movement.

Resolved, That we respectfully request the Council to have a copy of these resolutions forwarded by the official secretary to every state and local association in the United States, with the request for earnest consideration.

Resolved, That the women of the A. Ph. A. Women's Section desire to make it possible for the licensed members thereof to be able to exchange positions for stated periods, in order that they may be able to take advantage of educational facilities offered in other states, and at the same time be able to pursue their occupation, without being subject to the state boards of the various states; to be understood that such changes are but temporary; that the woman desirous of making the change is at the time employed by a reputable store or institution and has been a member of the American Pharmaceutical Association for at least two years, and has the personal endorsement of the President of the local branch, that such woman will report, both on assuming and quitting her duties, to the Secretary of the board who has afforded her the opportunity of carrying out her wishes. Also, that a practical yet comprehensive voucher be given to each one who, complying with the requirements, desires to take advantage of the opportunity.

Be it further resolved, That an earnest request for the passing of this resolution by both the Women's Section and the entire American Pharmaceutical Association be made, because it will surely broaden and make better each one's view of her life-work.

ST. CLAIRE RANSFORD-GAY.

Resolved, That we extend to the officers and committees of the Women's Section our keen appreciation and sincere thanks for their earnest efforts during the past year.

Resolved, That we extend to the chairman of the Executive Committee, Miss Zada M. Cooper of Iowa City, our grateful thanks and appreciation for her untiring effort in the preparation of the program of the Women's Section for this meeting.

WHEREAS, Our stay in San Francisco during the days of the Convention of the American Pharmaceutical Association has been one uninterrupted succession of surprises and enjoyment prepared for us by the generous hospitality and sacrificing friendship of the ladies of the California associations, their friends and the local committee, who by their loyal and unselfish devotion to our welfare and happiness have won our hearts and merited our everlasting thanks and appreciation; therefore.

Resolved, That we, the Section of Women of the American Pharmaceutical Association, hereby express our heartfelt thanks to our sisters of the Pacific Coast, and the various committees that planned and carried out these entertainments, thereby making us forget all cares and worries, and leaving in our hearts the sincere feeling of gratitude, friendship, and sisterly love for all time to come.

MRS. JOHN G. GODDING, *Chairman,*
MRS. W. C. ALPERS,
MRS. J. H. BEAL,
MRS. C. M. SNOW,
MRS. A. V. PEASE.

Mrs. Phillip: I move that the Secretary send out to all of the families of American Pharmaceutical Association members in good standing women membership card saying, " You are a member because your husband is."

(The motion was carried.)

The President appointed the following on the Nominating Committee: Mrs. Fennel, Mrs. Godding, and Mrs. Howard.

The President: Miss Cooper has taken all the responsibility this year in geting together the program. It was an elaborate one, with many things to be discussed, and has entailed upon her part a great deal of work. I wish Miss Cooper would say something about what might be done to help the Women's Section this year.

Miss Cooper: I think I cannot say anything more than I said in the report of the Executive Committee. We must find some way to interest the women who are associated—the women of the families of the members of the American Pharmaceutical Association. I am free to admit that I do not know how to do that. In my work as member of the Executive Committee I wrote a great many letters and did not, in many instances, get replies, so that I am unable to say what the attitude is. Where I have been able to get an expression of opinion women seem interested. I feel that the women pharmacists want to know the non-professional women and feel the need of their acquaintance. We don't want to give up our acquaintance with other women because of our profession, and I know the professional women are very anxious to see this Section succeed on the basis on which it was originally established—both classes of women. But I have not come to a decision in my own mind as to any one particular thing it would be best to do. The suggestions which you have just heard made by other women as to what the Section can do, in every case I can heartily approve. I do not feel, however, that we should feel so very much discouraged when we consider how long we have been in existence and the small attendance there is sometimes at the other sections that have been working so many years. Perhaps we should not expect to interest everybody the first year. I think we cannot. One thing I do believe is that the women of the families do not understand as thoroughly and as well as they should what the intention of this Section is.

The matter of placing the meetings of the Women's Section on the program

was discussed, and it was decided to leave that for the incoming officers to work out. The meetings should be timed so that the sessions would not conflict with any other sessions to prevent the professional women attending. Also the room for holding the meetings should be definitely decided upon.

The Nominating Committee reported as follows:

Honorary President: Mrs. F. C. Godbold, New Orleans.
President: Mrs. G. D. Timmons, Valparaiso, Ind.
First vice-president: Mrs. W. Bruce Phillip, Fruitvale, Calif.
Second vice-president: Mrs. E. A. Ruddiman, Nashville, Tenn.
Third vice-president: Miss Jean Gordon, Chicago, Ill.
Secretary: Miss Anna G. Bagley, Columbus, Ohio.
Treasurer: Mrs. W. B. Day, Chicago, Ill.
Historian: Miss Bertha Ott, Cincinnati, Ohio.
Member Executive Committee: Miss Clarissa M. Roehr, San Francisco.

The Secretary was instructed to cast the ballot for the nominees.

The President: Is there any further business to come before this Section at this time? If not, we will stand adjourned.

Miss Cooper: I would like to move that we again express our appreciation of what our President has done by a standing vote. (The members rose in response to the vote.)

The President: May I wish you all a pleasant time at the Exposition, a pleasant year, and express the hope that I may see you again at the next convention. I thank you for your assistance at this convention. Adjourned.

THE PHARMACIST AND PUBLIC HEALTH.*

BY MRS. G. D. TIMMONS.

The training of the pharmacist eminently fits him to be a potent health factor in the community. This special training gives him definite knowledge concerning the compounding of drugs and skill in their identification. If the doctor sent *all* of his prescriptions to the pharmacist and the pharmacist, in turn, insisted upon a prescription from the doctor, each would be doing the work for which he was trained and, at the same time, conserving public health.

Outside of his professional line of drug merchandise, the pharmacist gives *special* thought to securing such other stock as has to do with the health and comfort of his community. Toilet articles, everything that cleans and purifies, as paints, oils, varnishes, wall-paper, etc., and particularly germicides and insecticides, do much to promote the public health. Side-lines should not lower the dignity of the pharmacist. Unscrupulous is a word that should *never* be used with reference to the pharmacist and seldom is, for he usually prefers to carry any side-line that is at all suitable in a drug store, rather than doubtful patent medicines, etc. A drug, good for every ailment, is not often seen advertised, except by "quacks." The pharmacist advertises his side-lines mainly, leaving his drugs to be sold only as the

* Read before Women's Section, A. Ph. A., San Francisco meeting.

doctor prescribes. The elimination of spirits and narcotics from the pharmacist's sales, except as prescribed, scores for public health as well as for ethics.

Pharmacists are demanding a standard price. A " cut price " usually means a less pure article. Pure drugs are now easily obtainable, and the " up-to-date " pharmacist uses the best, and if they are drugs which deteriorate, he buys in small quantities to insure freshness. The suggestion often given to the housewife to buy her spices at the pharmacy speaks well for the purity of drug-store products.

The pharmacist strives for elegancy in pharmacy, and *this*, with the background of cleanliness and order, not omitting his own person, stands for right living in the community. His store thus becomes an object lesson in sanitation. The same rules could be observed in our markets and groceries with splendid results.

It is deplorable that, while the pharmacist's motto is to serve others well and aid in health, his long hours and close confinement have often made him a prey to ill health. We are gratified to know that legislation is beginning to take care of this wrong.

People are getting away from the old idea that they must have drugs for everything; rest, dieting, adjustment and prevention are oftener considered. A periodic health examination has now been suggested. The progressive pharmacist may keep abreast of the times and maintain his high profession as a public health benefactor by being a good analyst or a bacteriologist. A little laboratory, fitted up for some special work, is a valuable addition to any store, and every pharmacist may feel well repaid for being a good chemist in the added ability for service. Vaccines, serums, anti-toxins, etc., are well worth understanding thoroughly. The pharmacist will always be in demand to render first aid in emergency cases, and here his professional training is of vital importance to the public health.

The world will always need pharmacists, but their activities will be changed as science advances. The attendance at educational meetings and the interest taken show that the pharmacist realizes the advantages of keeping in touch with scientific advancement.

Women have long looked to the health of the home; they are now going outside of it to get at the causes of disease, thereby safeguarding the home. Hence we are keen to appreciate the pharmacist's exalted place in this great movement for public health. We trust that every pharmacist realizes, as we have assumed that many do, the great privilege that he has, by virtue of his profession, to conserve the health of the community.

VALPARAISO, IND.

SECTION ON HISTORICAL PHARMACY, AMERICAN PHARMACEUTICAL ASSOCIATION

EAST INDIAN VOYAGES OF THE SIXTEENTH AND SEVENTEENTH CENTURIES IN THEIR RELATION TO DRUGS, SPICES AND DYESTUFFS.*

BY ARTHUR W. LINTON.

SPANISH VOYAGES.

While many important drugs were added to our materia medica as a result of Spanish explorations in the Western Hemisphere, it is not within the scope of this paper to discuss these. Hence no more than incidental reference will be made to Spanish voyages to the Americas. We should not lose sight, however, of the fact that it was a search for the Indies which first took the Spaniards to America. Columbus started on his first voyage, not in the expectation of finding continents between Europe and Asia, but confident of discovering a direct route to Cathay.

In 1493 Pope Alexander VI divided all of the lands that had been or were to be discovered between the crowns of Spain and Portugal. The dividing line was a meridian passing through a point 100 leagues west of the Cape Verde Islands; the Spaniards were to have all between this point and another 180 degrees to the westward; the remainder was to belong to the Portuguese. By a convention between the two countries it was agreed to move the line 270 leagues to the west of the point designated by the Pope, also that each party should be free to sail in the seas belonging to the other, but that neither should attempt to trade outside of his own dominions. (Purchas, ii, pp. 64–65.) Possibly the bull and the convention would have been sufficient to avert misunderstanding, had men been able to measure longitude accurately in those days.

It will be remembered that the Portuguese had found the source of cloves to be the Molucca Islands and that of nutmegs the Bandas; both groups well to the eastern part of the Indian Archipelago. Spain was soon to cast longing eyes toward the islands which produced such coveted spices. In Purchas we find the following extract from an old record: "Fernandus Magalianes, a Portuguese, having made proof of his valour in Africa and India, being rejected in a suit to the King, conceiving deep indignation, renounced allegeance to King Emanuel, and went to the Court of Castile, where he acquainted the King of Spain that the Islands of Banda and the Moluccas appertained to him by that division which John II and King Ferdinand had agreed on . . . offered to discover these rich islands of spicerie from the west."

The King, apparently quite willing to believe that the coveted islands belonged to him, agreed to fit out an expedition. Magellan left Seville in August, 1519, with five vessels. One of Magellan's officers was Duarte Barbosa, a Portuguese who had spent several years in the Indies, and who, in 1516, had written his "Description of the Coasts of East Africa and Malabar," which is still one of our most reliable sources of information as to conditions in the Portuguese Indies in the early sixteenth century. The squadron sailed to Brazil and followed down

*Continued from p. 380, April issue.

the coast, spending five months at Port St. Julian, in Patagonia. Here mutiny broke out among the Spanish crews, and Magellan hanged and quartered the ring-leaders. The daring commander, on the flagship *Victory*, led the way through the terrible straits which have since borne his name. The mariners suffered dreadfully from cold and exposure, many members of the crews perishing during the passage. The Mare Pacificum was sighted November 28, 1520. Shortly after the open sea was reached one of the vessels stole away and returned to Spain.

Terrible experiences still awaited Magellan and the little company who went on. During the long voyage across the Pacific all of their drinking water "putrefied," and all of the food was consumed. They were reduced to the extremity of eating leather which had been dragged in the sea four or five days to soften it. In March, 1521, they reached an island, probably one of the Philippines; at least they visited a number of the islands of this group and spent some time on Cebu. On one of these islands Magellan was killed in a skirmish with natives. Duarte Barbosa became commander for a time, only to be killed himself.

Search was continued for the Moluccas. A call was made at Borneo, where the Spaniards found camphor, cinnamon, ginger, myrabolans, oranges, lemons, sugar, curcuma, and melons. In November, 1521, Tydore, in the Moluccas, was reached. The natives were friendly and exchanged cloves for quicksilver, glass cups, and red cloth. A treaty was made, and the King of Tydore sent presents to his royal brother of Spain. Leaving the Moluccas, the Spaniards visited Timor, where they found white saunders (sandal-wood) and ginger.

The *Victory* alone completed the circumnavigation, reaching San Lucas, near Seville, September 7, 1522. (Purchas, ii, pp. 84–119.)

Another Spanish expedition under Villa Lobas was despatched to the Moluccas, and others followed. The Spaniards established trading stations. The Portuguese, however, did not intend to divide the rich trade of these islands with another nation. A party of Spaniards was captured and taken to Goa, where they were treated kindly and sent to Spain. (Purchas, xii, pp. 142–143.) For a number of years the two nations quarrelled and fought. Each maintained that the Moluccas fell within the dominions granted it by the Pope, and each party had maps to prove the justice of its claim. (Hakluyt, ii, pp. 174–176.)

The Spaniards continued to send expeditions to the Moluccas from New Spain (Mexico). The natives allied themselves alternately with Spanish and Portuguese. Every new Portuguese commander came with orders to drive out all intruders. The strife between the two nations was ended only when the Emperor Charles V, in 1529, sold to Portugal his claim to sovereignty of the islands. The price received is variously stated at from 35,000 to 350,000 ducats. (Tschirch, p. 732; also, Motley, iv, p. 246.)

So intent had the Spanish been upon securing a portion of the Molucca trade that apparently for a time they neglected the Philippines, some of which Magellan's expedition had explored before reaching the Moluccas. In 1566 an expedition sent out from New Spain, under Lopez de Legaspi, further explored the Philippines, baptized some of the natives, and laid the foundations of the city and fort of Manila. This city continued to be the centre of Spanish influence in the East, and came to be much resorted to by merchants from China, who brought musk, silk, and porcelain. Every year ships went from New Spain to bring the products of the islands and those obtained by commerce with China. (Purchas, xii, pp. 147–153.)

The Spaniards also sent an expedition from Peru, which, sailing far into the

South Pacific, discovered a group of islands exceedingly rich in gold, and producing also cloves, ginger, and cinnamon. Supposing these to be the islands from which King Solomon obtained the gold to build his temple, the Spanish named them the Solomon Islands. It was planned to colonize this group, but Drake's circumnavigation led the Spaniards to conclude that a colony there would probably be plundered by English expeditions. (Hakluyt, xi, pp. 287–290.)

DUTCH VOYAGES.

We have seen that during the sixteenth century Europe's supply of spices came around the Cape of Good Hope in Portuguese carracks. This traffic made Lisbon the most important commercial city of Europe. Her docks and warehouses were piled high with all of the aromatic products of the distant East. The transportation of these wares to the various distributing centres of northern Europe the Portuguese left to other nations. The Venetians, in their era of prosperity, proud to be merchants as well as conquerers, had increased their profits on the spice trade by sending trading vessels to French, Flemish, and English ports. The haughty Portuguese apparently considered such traffic a matter too small to merit their attention.

During the sixteenth century the carrying trade between northern and southern Europe had passed almost entirely into the hands of the Hollanders. The discovery of the sea route to India had greatly benefited the cities of the Netherlands, especially Antwerp and Amsterdam. Motley, with his rare ability, paints a graphic picture of the commerce of Holland at this period. "The nations of the Baltic and of farthest India now exchange their products on a more extensive scale and with a wider sweep across the earth than when the mistress of the Adriatic alone held the keys of Asiatic commerce. . . . In Holland, long since denuded of forests, were great markets of timber, whither shipbuilders and architects came from all parts of the world to gather utensils for their craft. There, too, where scarcely a pebble had been deposited in the course of the geological transformations of the planet, were great artificial quarries of granite, of basalt, and of marble. Wheat was almost as rare a product of the soil as cinnamon, yet the granaries of Christendom and the magazines of spices and drugs were found chiefly on that barren spot of earth. There was the great international mart, where the Osterling, the Turk, the Hindoo, and the Atlantic and Mediterranean traders stored their wares and negotiated their exchanges. . . ." (Motley, "United Netherlands," iii, pp. 544–545.)

The group of States which in the sixteenth century comprised the Netherlands consisted of 17 provinces, which we may consider in three groups: the Walloon provinces next to France, the central or Flemish provinces corresponding approximately to modern Belgium, and Holland, which included most of the coast States. The entire group was united under the States-General, but the power of this body was subject to that of Spain, of which the Netherlands was a tributary.

In 1567, unable longer to remain submissive under the intolerable rule of Philip II, the Netherlands commenced that struggle which, in spite of internal dissensions and numerous crushing defeats, was finally to yield them their independence.

It may, at first thought, seem remarkable that for many years of the time during which the States and Spain were locked in this bitter struggle commerce between the two countries went on with apparently little interruption. The explanation is found in the fact that the two were mutually dependent. To build and equip the fleets which Spain was sending to her over-sea dominions, as well

as against Holland itself, Spain needed timber, tar and other naval stores which the Dutch ships brought from the Baltic ports. She also needed the grain and provisions of which the Hollanders were chief distributers. As for Holland, she was forced to buy and sell wherever trade was to be had. Whatever prosperity the Netherlands enjoyed at that period was built upon commerce. No more than Venice could they be prosperous if shut off from the world's markets. However, this condition of affairs was radically changed soon after the union of the crowns of Spain and Portugal in 1580. Philip now decided to strike a blow at the Dutch by destroying their commerce. Since William of Orange out-generalled his best generals, and the sturdy burghers outfought the Spanish infantry, at that time considered the finest troops in Europe, Philip would bring them to time by starving them. He forbade Dutch vessels to trade in ports of Spain or Portugal. This order meant to the merchant whose ship went to Spain loss of the vessel by confiscation; to the crews it meant prison and the Inquisition.

Sir Walter Raleigh mentions this action of Philip's as one of the five reasons for the "upgrowing of the Hollanders and Zealanders," . . . "and the fifth: the embarging and confiscating of their ships in Spain, which constrained them, and gave them courage to trade by force into the East and West Indies, and in Africa, in which they employ one hundred and eighty ships, and eight thousand seven hundred mariners. The success of a counsel so contrary to their wisdom that gave it as all the wit, and all the force the Spaniards have, will hardly, if ever, recover the damage thereby received." (Sir Walter Raleigh, "The Invention of Ships," in Old South Leaflets, vii, p. 309.)

The situation was a serious one for the Netherlands, especially for the maritime provinces. Not only had Holland at this time the largest merchant marine that had ever been known, but a larger proportion of the population were mariners than had been the case in any nation up to that time. (Motley, iii, p. 546.) Now she found herself denied the carrying trade of the greatest power in Europe, denied the distribution of the products of the East and West Indies which all the world was demanding. It was not strange, then, that the Hollanders turned their thoughts to the possibility of a direct commerce with the Indies, which, in spite of their splendid merchant marine, they had never yet attempted. It is a curious fact in regard to the Portuguese control of the East Indian traffic during the sixteenth century, that the other nations seem to have tacitly acknowledged their title to the Cape route by right of discovery. Because they had blazed the trail, they had a certain claim to the exclusive use of it.

However, if the exclusive right to a sea route was granted, the Protestant nations, at least, did not admit the right of a Pope to divide the Indies between Spain and Portugal, as Pope Alexander VI had done. Holland and England both believed that if they could only find a way of their own to Cathay and the Indies, for instance by a northeast or a northwest passage, they would have a perfect right to trade with those countries.

Any scruple which the Dutch may have entertained in regard to the propriety of using the Portuguese route was removed when Portugal came under the dominion of their arch-enemy, especially since he had forbidden them his ports. There was just one remaining reason why the Dutch did not at once follow the Cape route; namely, they did not know the way. This route was never used until the English voyage of 1591, except by the Portuguese. The Portuguese had a thorough knowledge of the route, accumulated by long years of experience in following it, but this knowledge they had jealously guarded.

For this crisis in the affairs of the Dutch a man had been in training. Jan

Huyghen van Linschoten was born in Haarlem about 1563. At the age of sixteen he went to Seville, in Spain, to join two brothers who had been there for some years. In 1563, impelled by a desire for travel and adventure, he joined himself to the Portuguese Indian fleet. While on the outward voyage he was fortunate in receiving an appointment to the suite of the Archbishop of Goa, who was a passenger on the same ship. Jan remained in the service of this dignitary for five years, at the end of which time the Archbishop left for Europe, expecting to return to Goa. However, he died on the voyage, and, hearing of this, which meant that his own prospects for advancement in India were destroyed, Jan decided to return to his native land. He spent two years in the Azores, finally arriving in Holland in 1593. In 1595 and 1596 an account of Linschoten's voyage to the East Indies appeared in print. This work proved to be a storehouse of information for all who were interested in the Indies, and was exactly what the Dutch needed. Linschoten had recorded his observations of the social, political, and religious institutions of the native races of India, as well as those of the Portuguese who had established themselves there. He wrote with accuracy of the plant and animal life and of the physical and political geography. He described the commercial products and discussed markets and means of transportation. Most important of all, perhaps, to the Dutch, was the information he gave in regard to routes from Europe to India and to all parts of the Indian Archipelago. He included notes on winds, currents, shoals, and harbors. His work was for the scientist, the merchant, the navigator. It would be difficult to overestimate its importance in stimulating and assisting the Dutch in the work they were about to undertake. (Jan Huyghen van Linschoten, from English translation of 1598, H. S., Introduction; also, Motley, iii, pp. 547–548.)

Before considering the East Indian voyages of the Dutch, we should note the efforts they made to find a route all of their own to Cathay and the Spiceries. Linschoten himself and other Dutch geographers and navigators believed that the northeast route would cut 10,000 miles from the long journey to the East. The first expedition, in 1594, reached Nova Zembla and thoroughly explored and charted its coast. In 1595 a second expedition was fitted out. So confident were the promoters that this one would be successful that a stock of articles for barter in China was carried. The only products brought back were a quantity of pebbles considered to be "a kind of diamonds." A third expedition of two ships, manned by carefully selected crews, sailed in 1596. One ship's company wintered at 76° N. The effort spent on these expeditions was not entirely wasted, for on all of them accurate astronomical, geographical, and meteorological observations were made. (Motley, pp. 572–578.)

The first Dutch expedition to attempt the Cape route consisted of four vessels: the *Maurice, Holland, Amsterdam,* and a pinnace, under the command of Cornelius Houtmann. Leaving the Tessel in April, 1595, the Stormy Cape was sighted just four months later. Since cloves, nutmegs, and mace were more valuable than pepper and ginger, Houtmann directed his course to the islands of the Far East. We read that they reached Sumatra in May, 1596, and in June passed through the Strait of Sunda, between Sumatra and Java. By this route they avoided the Straits of Malacca, the narrows of which were guarded by the Portuguese fort at the city of Malacca. Nevertheless, the Dutch vessels did not escape the notice of the Portuguese, for we learn that on July 6 the Dutch were warned of a plot to destroy them. The principal officers were to be invited to a feast given by a certain Javan prince, and during their absence the Portuguese were to spoil the ships. In December they reached Tuban and Cydaia, and pur-

chased nutmegs and cloves. Here they had another evidence of Portuguese hostility in an attack by natives instigated by the Portuguese. The expedition reached home in August, 1597. So heavy had been the losses from scurvy that the ship *Holland* did not have enough well men to weigh the anchor. (Purchas, v, pp. 196–201.)

This first expedition had lost heavily in men, but at that time, as later, human life was held cheap when great commercial gain was in prospect. Dutch ships had brought spices directly from the East Indies, and men, money, and ships for another venture were not lacking. Within a few months after the return of the first voyage a fleet of eight vessels was on its way. In December, 1598, three of these rode in Bantam harbor. (Bantam is at the extreme western end of the Island of Java. In the sixteenth and seventeenth centuries it was a very important pepper market.) The other five ships arrived later, reporting 35 dead and many sick among their crews. The Bantamites welcomed the Dutch and ejected the Portuguese factors. The thrifty Hollanders were delighted to find that for one pewter spoon they could purchase in Bantam enough food to supply a man for a week. In 1599 four ships of the fleet were laden with pepper and started homeward; the others went on in search of cloves and nutmegs. Their full itinerary is not available, but we know that two of them reached Banda and bartered there for nutmegs and mace. All were home by April, 1600. (Purchas, v, pp. 201–205.)

The Dutch were not satisfied with making trial of only one route to India, but in July, 1598, started a fleet of four sail, under Oliver van Noord, to make the voyage by way of the Straits of Magellan. We have learned of the discovery of this route by Magellan on his voyage of circumnavigation; since then it had been used not only by the Spanish but by an English squadron under Drake in 1577, and a second under Cavendish in 1586. The chief pilot of the Dutch expedition was Captain Melis, who had made the voyage with Cavendish. Having accomplished the dangerous passage through the Straits, van Noord ran off the South American coast at St. Iago (Valparaiso) and captured two Spanish vessels. Striking across the broad Pacific, the fleet touched at the Ladrone group, and later reached the Philippines. At that time the Spaniards sent every year from New Spain (Mexico) great carracks to bring silk, gold, and spices from the Philippines. Van Noord found two of these vessels in Manila harbor, and there ensued a battle in which one ship of each flag was sunk. The Dutch traded for mace at Jurtan and for pepper at Borneo, sailing home by way of the Cape of Good Hope. (Purchas, ii, pp. 187–206.)

To return to the Cape route and the fleets which followed that way to India: Not waiting for the return of the second voyage, the enthusiastic Hollanders fitted out two other expeditions, one of three ships and one of four. Several companies were organized, and other ventures followed one another at intervals of a few months. In 1601 a fleet of 13 vessels sailed from Amsterdam. Between 1595 and 1601 46 ships were sent to India by the Dutch, of which, in due time, 43 returned richly laden. (Purchas, v, p. 227.)

Up to this time the Indian ventures had been free to all associations of Dutch merchants, but this was not to continue. Holland, in the opening years of the seventeenth century, was to give birth to a monopoly which grew to compare in size with the great ones of the early twentieth century. Very soon after the Dutch commenced to trade with the Indies the complaint began to be made by merchants that spices were becoming too cheap in Europe. Possibly some of the thrifty Dutch housewives were pleased that this was the case; if so, they seem to have had no voice in the action which followed. Probably their "Consumers'

League" was not well organized. Although the desire of the merchants to maintain prices was one of the factors which was working to cause a union of the companies, there was another and more important reason. The nation understood that the Indian fleets must be able not only to defend themselves against the efforts already being made by Spain to sweep them from the seas, but they must be prepared to strike back and to strike hard. To capture a spice-laden carrack meant not only cargoes for the Dutch galeots; it meant also a blow at Spanish power. The States-General had no ships to spare to send to distant seas; the merchants must have an organization of their own, powerful enough to provide not only ships and sailors, but guns and fighting men as well.

On March 20, 1602, the States-General granted to the Universal East India Company a charter conferring the exclusive right to trade to the eastward of the Cape of Good Hope, and to sail through the Straits of Magellan. The capital stock was 6,600,000 florins. The company was given power to make treaties with Indian princes in the name of the States-General, to levy troops, and to build forts. Of the value of the prizes captured from the enemy a certain percentage was to go to the Admiralty. (Motley, iv, pp. 132–135.) Before the end of the year the company's first fleet, consisting of 14 vessels, under Admiral Wybrand van Warwyck, was *en route* to the Indies. These were more than simple merchant ships that sailed from Amsterdam and Rotterdam during the first years of the seventeenth century. Built as they were to carry merchandise, they could be, and frequently were, transformed to ships of war on very short notice. Many of the captains had seen service by land or sea in the wars with Spain. Every Zealand fisherman who shipped for the Indian voyage knew that he might be called upon to fight to protect the cargoes of his company, or to win other cargoes at push of pike and thrust of sword. We have already noted van Noord's battle with the Spanish in Manila Bay; other fights followed in rapid succession. Armadas were despatched from Spain to protect the factories scattered through the Indies, as well as the richly-laden carracks with their great cargoes of pepper and cloves, musk and ambergris.

In 1601, Jacob Heemskerk, while bartering with the King of Jabor on the Malay Peninsula, was informed of the approach of a Portuguese carrack from Macao. The carrack was manned by a crew of 700 or more, while Heemskerk's two small craft had together only 130; but he did not shrink from the encounter. After a short conflict Heemskerk was able to divide booty amounting to over 1,000,000 florins among the members of his crews. The spoils of battle included silk, sugar, cotton, and musk. (Motley, iv, p. 108.) In 1602, Spilberg, a Dutch commander who had recently been entertained by the King of Ceylon, "to gratify the King," fought and captured three Portuguese ships and gave the captains to the King. Spilberg was the first Hollander to trade to Ceylon for cinnamon. Wolfert Hermann, the commander of five small vessels, encountered near Bantam an armada commanded by Andreas Hurtado de Mendoza, who had been commissioned to purge the Indian seas of the Dutch traders, and to chastise the natives who had dared to hold commerce with them. Hermann's squadron was hopelessly outclassed, since Mendoza's vessels numbered 25 or more, and his flag-ship alone was superior in weight and armament to Hermann's combined force. The Dutch, although they did not dare to come to close combat, harried the armada for three days, capturing two vessels and sinking and driving ashore a number of others. Mendoza considered it prudent to leave these antagonists, and found less dangerous ones in the natives of Amboyna, whose villages and spice groves he destroyed. (Motley, iv, pp. 106–107.) The King of Bantam might well greet the Dutch as

his deliverers. In Bantam was established the first factory of the Hollanders, and near this vicinity were laid the foundations of the city which eventually became the capital and metropolis of their colonial empire. "Not many years later, at the distance of a dozen leagues from Bantam, a congenial swamp was fortunately discovered . . . and here a town, duly laid out with canals and bridges and trim gardens and stagnant pools, was baptized by the ancient and well-beloved name of Good-Meadow, or Batavia, which it bears to this day." (Motley, iv, p. 107.)

Many other naval battles between Hollanders and Portuguese might be mentioned. In every sea the contest was waged; wherever the hostile ships sighted each other the red flag went to the mast-head and the merry conflict commenced. The Dutch were usually inferior in numbers of ships and men, as well as in the weight of ships, but in the majority of cases they were victorious, or at least inflicted a much greater loss than they suffered. Nor was this due wholly to superior bravery on the part of the Hollanders. The Dutch galeots, vessels of from 100 to 200 tons, at this period, broad, bull-nosed, and clumsy as they would appear to-day, were the best sailing craft of their time. The Spanish carracks, some of them 500 to 1000 tons or even larger, were slow, topheavy, and even more unwieldy than the galeots. The latter could sail all around the carracks, could fight from any range or angle they desired, and frequently had their adversaries in a position in which they could not use a single gun. Hermann won his battle against great odds, just as many another Dutch commander did, by outsailing and outmanœuvring his antagonist. (Motley, iv, pp. 106–107.)

The Dutch were not satisfied to whip the Spaniards only on the sea, but within a few years after their first voyage were bombarding and taking by storm the Portuguese and Spanish forts all over the Indies. They devoted their energies especially to reducing the strongholds of the enemy in the Eastern Archipelago. We have seen them established at Bantam. They soon held forts at Jahore (Malay Peninsula), at Achin (in Sumatra), and on Amboyna (one of the larger Molucca group). From the first the true Moluccas, comprising Ternate, Tydore, Motiel, Makian, and Baera, were a bone of contention. For centuries before the Europeans came, Chinese, Malays, Persians, and Arabs had fought for these "Clove Islands." The Portuguese had established themselves here in 1512, but, as we have seen, soon had to maintain their title against the Spaniards. Not until Charles V sold his title did strife between Portuguese and Spaniards cease, and now the Dutch had arrived to cause further trouble. The King of Ternate had willingly submitted himself to the Dutch; Tydore remained loyal to the Portuguese. In 1605, Cornelius Sebastian, with some assistance from the Ternatans, undertook to storm the castle of Tydore. It was bravely defended by the Portuguese, but the explosion of the magazine at a critical moment in the conflict almost ended Portuguese resistance. There was an English fleet in the harbor at the time. The English claimed to be neutrals, but were accused by the Dutch of having furnished ammunition to the Portuguese. ("Voyage of Sir Henry Middleton," H. S., pp. 50–58.)

In 1607 the Spanish sent a force from the Philippines which secured control of the Moluccas, only to be dispossessed by the Dutch under Matelieff. In these contests between the various European nations for the control of the Moluccas and their cloves the poor native, like the "innocent bystander," always suffered.

Motley's comment on the wars and dissensions, caused by the apparently inoffensive clove, cannot fail to interest: "The world had lived in former ages very comfortably without cloves. But by the beginning of the seventeenth cen-

tury that odoriferous pistil had been the cause of so many pitched battles and obstinate wars, of so much vituperation, negotiation, and intriguing, that the world's destiny seemed to have almost become dependent upon the growth of a particular gillyflower." ("Gillyflower," an old name for the clove. French name of to-day is *girofle.*) "Out of its sweetness had grown such bitterness among great nations as not torrents of blood could wash away. A commonplace condiment enough it seems to us now, easily to be dispensed with, and not worth purchasing at a thousand human lives or so the cargo, but it was once the great prize to be struggled for by civilized nations." (Motley, iv, p. 245.)

Somewhat later in their Indian career, finding it impossible to completely control the output of cloves from the Moluccas, the Dutch adopted the policy of introducing the tree into Amboyna and some other islands which were securely under their control, and extirpating it from the Moluccas. This policy seems to have been successful in giving them the monopoly. The clove tree is not found to-day in the Moluccas. (Flückiger and Hanbury, p. 283.) Tavernier, in the middle of the seventeenth century, found that the Dutch clove monopoly was not absolute, because the Dutch factors surreptitiously traded it to native merchants for rice and other merchandise. Tavernier, who was prejudiced against the Dutch, says that the factors were so miserably paid by their company that they were forced to follow such practices in order to subsist. (Tavernier, ii, p. 16.) In the case of the tree (*Myristica fragrans*) which produces nutmegs and mace, the Dutch made determined and persistent efforts to restrict it to the Banda Islands. In order to prevent propagation elsewhere, they early introduced the practice of immersing the kernels in milk of lime for three months. It was later discovered that the exposure of the kernels to sunlight for a week would have accomplished the same purpose. The Dutch are said to have frequently carried in stock at Amsterdam the entire nutmeg crop of 16 years. (Flückiger and Hanbury, pp. 504–505.) We find in 1620 one of the English captains writing to this company that the Dutch had forced the natives of Poolorom to present them with a nutmeg tree planted in a basin of the earth of the island, this symbolizing that the island and its products were to belong to the Dutch. ("Calendar of State Papers," Colonial East Indies, 1617–1621, p. 423.)

The Dutch seem also to have early secured a monopoly over cinnamon, at least over Ceylon cinnamon, produced on the island of that name. Tavernier tells us that in the middle of the seventeenth century it all came from Ceylon, and, further, that in the season of cinnamon harvest the Dutch were obliged to use 1500 or more armed men to guard the natives who gathered it. The guard, which was necessary because of the hostility of the King of Kandy, greatly increased the cost of the cinnamon. (Tavernier, ii, p. 18.)

Batavia, the capital of the Dutch Indies, grew to be a great and flourishing city. By reason of the grandeur of its buildings, wealth of its inhabitants, and vast extent of its commerce, it came to be called the "Queen of the East." François Leguat, who visited the city near the close of the seventeenth century, nearly 100 years after the Dutch first rounded the Cape, has given us a description. He tells us that it was built of white stone and that the streets were fine and beautiful. Like all well-regulated Dutch cities, Batavia was intersected by canals. A strong citadel, mounting 60 pieces of artillery, was garrisoned by a thousand men. The population was a cosmopolitan one, including, besides Dutch and Javanese, French, German, Portuguese, Chinese, and Moors. The city was the centre of all Dutch activities in the Indies, both political and commercial. The General or President was absolute in authority. Unlike the Portuguese viceroys, he held office for

life. Roman Catholics were allowed freedom of conscience, but not the privilege of public worship. ("Voyage of François Leguat," H. S., p. 221.)

Jean Baptiste Tavernier, a French diamond merchant, about 1649 made the homeward voyage from Batavia in one of the Dutch East India Company's vessels. He has left us one of the best descriptions of a voyage of this period.

Shortly before the departure of the vessel from Batavia it was visited by the Surgeon-general, whose business it was to make sure that no servant of the company was going home for medical treatment who could be cured in Batavia. Another inspection was made by a military officer to make sure that no soldier was going without leave. After a run of 54 days the vessel arrived at the Cape, and, as was the custom, made a stay of several weeks for refreshment. The Dutch maintained a fort and a village at this place. Any soldiers or sailors who were willing to remain were allowed to do so, as the policy was to build up a strong settlement here. The natives brought for barter cattle and young ostriches; the latter were purchased as delicacies for the sick. The Hottentots, degraded as they were, Tavernier says, had a knowledge of simples, and were able to cure 19 members of the ship's company who were afflicted with ulcers and wounds. The sailors were allowed to go ashore in parties, those with a record of good behavior being given the first opportunity.

The next stop for refreshment was made at St. Helena, in the South Atlantic, afterwards famous as the prison of Napoleon Bonaparte. The run from the Cape to St. Helena, Tavernier tells us, was looked forward to by the sailors with much pleasure, since the winds were nearly always favorable and steady; hence there was no necessity for changing sail. Immediately on arrival at St. Helena all hands were employed for two days in scraping the hull. This being completed, the crew was divided into two parties, each of which in turn was sent ashore for 11 days for rest and refreshment.

In those days of long voyages, when canned and preserved fruits were almost unknown, and refrigeration had not been dreamed of, these long stops were necessary to prevent and to cure scurvy. Even with this precaution, few voyages to the East Indies were made at this period without some deaths from this dread disease; in some cases a large percentage of the crew was lost.

Tavernier tells us that the party ashore, having killed wild pigs and gathered sorrel which grew there, cooked the pork and sorrel, together with rice from the ship, to make a kind of soup. This soup was an important article of diet during the stop at the island, and acted as a gentle purge. (Various species of oxalis are known as "sorrel." The leaves of the sorrels contain potassium binoxalate, and have been used as anti-scorbutics.) The men on shore were required to send some of the wild pigs to the vessel every day. Those on the ship were employed in catching fish for use on the remaining portion of the homeward voyage. Not only the crew, but the pigs, sheep, geese, ducks, and chickens on the ship were sent to have a touch of shore life and a diet of sorrel. The beasts and fowls became so fat that it was impossible to eat them on the way home.

A serious difference arose between the crew of the vessel Tavernier was on and that of another Dutch vessel which had reached the island a few days earlier. The seamen of the first vessel had gathered all of the limited supply of lemons found on the island, and had locked them in their chests. Since lemons were then as now regarded as one of the best remedies for scurvy, this attempt of one ship's crew to monopolize them was a serious matter. The commander of Tavernier's vessel, who ranked as vice-admiral, threatened to hang some of the offenders if the lemons were not disgorged. The sailors thought it wise to do so.

While the Dutch were at St. Helena, two Portuguese ships arrived from the Guinea coast with slaves for the mines of Peru. Some of the Dutch sailors, being familiar with the dialect of the Africans, found opportunity to tell them of the fearful treatment they might expect in Peru. A number of the slaves ended their misfortunes by jumping into the sea.

Leaving the island, the vessels sailed for three days through great beds of sargasso (*Fucus natans*). Tavernier erroneously speaks of the vesicles or floats as fruits. The homeward route was apparently by rounding the north of Scotland. While in the North Sea the voyagers were met by vessels which had been watching for them, and which brought them very welcome supplies of smoked meats, butter, cheese, biscuit, and beer. As the Indiamen ran through a fleet of herring fishers they traded spices for fresh herring.

Before land was reached the officers of the vessels met in council and passed judgment upon those members of the crews who had committed offences against discipline during the voyage. Two were sentenced to be hanged, a number of others to minor punishments. The sentences were executed before land was reached in order that there might be no appeal.

Many of the Dutch soldiers had participated in an attack upon the Philippines. Here they had pillaged some convents, and among other booty had secured a great number of wax candles. Now, as the vessels neared the coast of the homeland, a great number of these were lighted, producing, as Tavernier describes it, a remarkable illumination.

Members of the ship's companies were not allowed to carry their chests ashore. The latter were all sealed and carried to the house of the India Company, there to be examined by an official. This was one of the means adopted to prevent private trade. (Tavernier, ii, chapters xxvii to xxix.)

(*To be continued.*)

CO-OPERATION VS. INDIVIDUALISM.

Through the history of the past runs a dominant chord, namely, the efforts of man to bring about a state of equilibrium between the rights of the individual and those of the social whole. The nineteenth century was pre-eminently the age of individualism, and that individualism, carried to excess, brought about a social and industrial condition against which the prophets of the age, men like Thomas Carlyle, Ruskin, Hugo and Tolstoi, thundered. It was the epoch of machinery, of ultra-Darwinism, the effects of which hang like a black pall over the people of the present epoch. The twentieth century represents the subordination of the individual to group control; the greatest good for the greatest number. The spirit of co-operation is in the air, of brotherhood. Despite the ravages of the great war in Europe, humanity will arise phœnix-like from its ashes, and the torch of liberty will be carried forward again. In the field of education this subordination of the individual to the group is plainly seen, leading directly "to wider opportunity for the masses of the people to rise above their former level."

—*New Age.*

ANIMAL DRUGS USED IN MEDICINE DURING THE MIDDLE AGES IN ENGLAND AND FRANCE.*

BY GEORGE G. MARSHALL.

Pharmacy in the Middle Ages, especially in Great Britain, has an extremely curious history. The whole subject is so closely bound up with the social progress of the country, that one finds himself perusing the annals of history for a better understanding of the art of mixing and compounding.

The successive invasions of the Angles, Saxons, Jutes and Danes, together with the Roman occupation of the country, had a most important bearing upon the subsequent social development. The Saxons, for instance, introduced a wealth of quasi-scientific learning into the land, while the Romans, in turn, brought culture and learning from the South. As a result we have such works as savor of both stimuli, but which may, at the same time, be said to stamp themselves as typically English in their intrinsic character. Here we first find the "leech." Perhaps it might be well to define the word itself before proceeding. "Leech," derived from the Anglo-Saxon *loece,* originally meant a physician, or one who healed. Later, through a transposition of the idea for the thing, the term has become confused with the blood-sucking animal, used often by the early doctors to relieve congestion, etc.

The first of these men we have any record of flourished about the time of Ælfric. As was the case with many of the mediæval practitioners, he was more or less closely affiliated with the church. This is easily comprehensible if we remember that the so-called "higher education" was an accomplishment possessed by few except the fathers of the church, and possibly a few of the royalty, who had laboriously acquired little more than a pretence at enlightenment in the realm of letters. Thus we are not surprised to find the various remedies composed partly of herbs and partly of charms, weird incantations and invocations to the Deity. Furthermore, it is not strange that the monks should have been so conversant with the medical knowledge, considering the wide breach existent, at that time, between the super-wealthy knight, who lived, on the one hand, by plundering travellers and, on the other, by "squeezing" the wretched tenantry, eking out their existence on what the lord overlooked in his magnanimity. These wretched people were often so poorly nourished that frequent calls upon the monasteries for food, treatment and medicine were vitally necessary.

Many noted religious men, such as John of Tours, Bishop of Wells (1088–1123), Grimaldi, and others, brought new medical skill into England just after the Norman Conquest. (Med. Eng., Bateson, p. 76.) Laymen were also known to have been leeches. Payne (Med. Eng. in the Anglo-Saxon Times, p. 13) offers an instance in the ballad, "Sir Cauline." Here a knight is brought wounded to the castle, whereupon the king cries:

> "Come doun, come doun, my daughter dear,
> Thou art a leech of skill."

* Presented before Section on Historical Pharmacy, A. Ph. A., San Francisco meeting. This excellent paper, comprising in its original form eighty-two pages, was presented by Mr. George G. Marshall as his thesis for the degree of Pharmaceutical Chemist in the Cleveland School of Pharmacy. While it is impossible to print it in full, the abstract presented will give an idea of the literary research work and the devotion to its pursuit shown by the author. There is no statement in this thesis that has not been traced back to the original writer, and the amount of correspondence and expense that Mr. Marshall undertook to collect his material is most remarkable. The bibliography attached to the thesis shows that he was not satisfied to copy from modern authors, but in every case he went back to the original.

WILLIAM C. ALPERS, Sc.D., *Dean.*

This, apparently, points to the possibility of women leeches. An early English work of the fourteenth century gives a prescription said to have been used by Lady Beauchamp, the wife of the Earl of Warwick. The " new " women's movement is a very old one, after all.

Notwithstanding this seemingly democratic status of the " profession," we are safe to assume the religious orders to have had the monopoly, as it were, of the healing art. Within the cloister walls instruction was given the initiates into the priesthood along the lines of applied medicine, that they might aid the sick and starving. In this connection (Wellcome) the following is of note:

" Twig runes shalt thou ken
If thou a leech will be
And ken a sore to see
Of bark shall one then write

And a branch of wood whose
Limbs to east do lout."

The " Medicinale Anglicum," in referring to the leeches as " Leeches Know How," seems also to indicate a somewhat definite organization of remedies and doctors at that time. There likewise appears (Payne, p. 90, cross ref. to A. S. L., li, p. 83) in the recipe, " after the manner which leeches well know," following advice to the scarifying and poulticing of wounds, a further confirmation of the existence of a well-defined class of practitioners in that early period.

Recipe books in manuscript form appeared, embracing hundreds of curious formulas. Every commentator added to the collection until the copy was one vast phantasmagoria of paganism, religion, fact and superstition. The " Medicina de Quadrupedibus " and the " Herbarium " of Apuleius Platonicus, with formulas dating back to the tenth or eleventh century, are the most interesting. That these works enjoyed immense popularity is manifest. They persisted even down to the era of the printed page. In 1480 Johann Philippus de Lignamm printed the manuscript. In the treatise may be found the hart, dog, goat, lion, frog, bull, etc., together with sundry secretions and excretions from various animals.

QUACKS.

Such remedies are, in themselves, curious enough, but not altogether beyond our comprehension, since not only priests and leeches, but also fakes and quacks of every description, who masqueraded under the name of " herbalists," employed them. (Jusserand.) These fakers took their stand in the public places of a village, spread out their wares and proceeded to harangue the people, much as do our present-day quacks, who inveigle the gullible into buying patent " cure-alls." Even among the best doctors of the period we find remedies which must have had their source, certainly, among the fakes. The notorious Roger Clerk, who undoubtedly used such formulas as " Seven heads of fat bats," was, in 1631, sued for illegal practice of medicine in London. He had recommended that a highly preposterous charm be hung about a lady's neck as a sure cure for a suspected ailment. For a number of years a legal war was waged upon quacks, leeches, and pharmacists, because of their questionable methods and remedies. Finally, in 1542, a recognized pharmacopœia was established. The most flagrant discrepancies were struck out. Curiously enough, the book still embraced an astonishingly large number of quackeries and frauds. Crabs, oyster shells, secretions of human beings, etc., together with moss grown on the human skull, figured largely in the intricate

recipes. In fact, it was not until the year 1721 that such things as blind puppies and skulls were omitted from the London Pharmacopœia.

The persistence of so many animal ingredients may be looked upon by some as chronic professional unenlightenment. Were the matter looked upon purely in such a light, we might say the point well taken. Justification, however, is not hard to find for this apparent barbarism. So far back as man recalls, he has considered himself the supreme achievement of the Maker, and therefore the rightful measure of all things.

HUMAN BODY IN MEDICINE.

One need but to look into some of the old formularies to see what an important part the members of the human organism played in medicine as the positive cure for all manner of disease. Lemery's "Dictionnaire Universel des Drogues Simples," the early authority in France, as well as Pomet, contains a number of formulas based upon the above mentioned theory of man's physiological value as a remedy. In the Histoire des Drogues, seconde partie, pp. 1–8, are set forth the many virtues of human bones, secretions, etc., as well as their respective value as cures. Skulls, blood, urine, the nails of the fingers and toes, not to mention the secundine of woman, and much more, were employed as ingredients. Yet, these mediæval theories are not so unlike certain doctrines advanced by several present-day schools of medicine. Teaching, to-day, follows along much the same lines. Should a man show symptoms arising, primarily, from an organ not properly functioning, it is at once plain that that particular organ is weak. If this be so, it may be strengthened by supplying fresh vigor through the administration of the healthy counterpart of the weakened member. Thus, if a patient exhibits symptoms arising from abnormal thyroid secretions, due, perhaps, to an unhealthy condition of the gland, he is accordingly given a sufficient amount of the "prepared gland" to restore a normal anabolism. As it is the case now, so it was in the earlier times. To-day, however, medicine is in a state of much higher efficiency. At that time it was still darkened by superstition and unsubstantiated experiments.

Schroderus thus treats like with like—"The liquor distilled from the haires applied with honey causeth the haire to grow. The powder drunk helps the jaundice, applied with sheep's fatt it helps luxate the members, also it stops the hemorrhage in wounds." We find that the spittle of a fasting man was effective against the bite of a mad dog, while the filth of the ears, taken internally, is effective in colic. The falling sickness and rheumatism could likewise be cured, they thought, with mixtures prepared from human bone. "The blood of childbirth (Hartmann) helps the volatick scabb, being applied often with the secundine. Mummy resolveth coagulated blood. Taken it purgeth the head, helps obstruction of the menses and other uterine affections." This author then goes on to show the relatively greater merits of the Arabian mummy over the Egyptian, since the latter is prepared from bitumen and cheap preservatives, while the former is "a thick substance sweating out of dead bodies embalmed with aloes, etc." The torrefaction of dead bodies made a much inferior article, he points out, although such was the product usually palmed off as the genuine article. This was prepared from the body "of a red man (having thinner blood and better flesh) whole, fresh, unspotted, of 24 years old, dying of a violent death and not by disease, the musculous parts being cut in pieces and strewed with myrrhe and a little aloes, afterwards macerating it in the spirit of wine . . . leaving the pieces at length to dry in a dry aire and shadowy place, then will it be like flesh hardened in the smoke without stinking, etc." The tincture therefrom, they thought, relieved diseases of the breast. In fact, the exalted "oile of mummy is counted of such vivseck

quality that there is no particle into which it does not penetrate, nor corruption which it does not cure."

A belt or gloves of human flesh were supposed to greatly facilitate labor and mitigate the throes accompanying childbirth. The "Liquor Cranii Human" sounds rather barbaric to us. It was, at one time, considered highly potent. This "Liquor" was prepared from the unburied skulls which one could so easily pick up anywhere on the roadsides of England during the period when she was crushing outlawry.

With this historical fact well in mind, the enormous variety of preparations made from the human body is somewhat more comprehensible to us. In the early seventeen hundreds, be it remembered, all England was infested with ruthless beggars, highwaymen and "wanted" characters. What punishment the law provided, when they were once apprehended, was as thorough as expeditious. Little wonder superstition somehow centred around the effectiveness of criminals' bones as remedies, when bones were such a common article. Thus, Pomet, in 1694, was informed by a certain Moses Charas, who had resided in England for some time, that, "The Druggists of England sell skulls of the dead upon which has grown a greenish moss, called 'Usnea,' because it resembles the moss growing on the oak." "The great majority of these bones," he states further, "came from Ireland," where there was much trouble at just this time. Pomet cites again from the above source, "They frequently let the bodies of criminals hang on the gibbit until they fall to pieces." No doubt this furnished an object-lesson to those tempted of the devil. Skulls at that time varied in price in direct ratio to the fluctuations of the London market, which, in its turn, was a barometer of the vigilance of the local watchmen and beadles. Desirable skulls have been known to bring from 8 to 11 shillings apiece. Especially coveted were the moss-covered specimens. They commanded a still higher price. The Germans had a marked preference for the heads of those who had died a violent death. They were used in "Sympathetic Ointments" and "Epilepsy" cures. Lemery speaks of a certain "Magistry of Human Skull," made by calcining and powdering the article into a fine state. He further adds, "This magistry is only a dead-head of no virtue unless you employ the skull of a young man who has died a violent death."

Sir Halford, in 1835, printed a paper "On the Deaths of Some Eminent Persons." Herein he gives one of the prescriptions, signed by four physicians on the death-bed of Charles II. It called for "Twenty-five drops of the spirit drawn from human skulls" as one of the principal ingredients. Mayerne's celebrated "Powder de Guttetta" contained, among other things, amber, vitriolated hartshorn, human skull vitriolated and crude, and the secundine of woman. Whether these curious and once popular remedies fell into disuse through any moral awakening on the part of the public conscience, or whether it was through the discovery of a more effective and proper substitute, or again, whether it was the result of an ever-increasing dearth of material as the policing of England became more far-reaching, is a question open to much moral speculation. The solution, I would venture to say, lies rather in the realm of Ethics than in that of Pharmacy. Suffice it to say, Culpeper, so early as the last part of the seventeenth century, either as an ethical or as a practical substitute, recommended instead, "The ashes of the head of a coal-black cat as a specific for such as have a skin growing over their sight."

Furthermore, competition set in between the chief executioner (Wootton, Chron. of Pharm.) and the apothecaries in an endeavor to supply better human fat. Naturally, the former had the advantage of propinquity, and the first choice; but the latter, thanks be to the skill of the worldly pharmacist, produced the finer article,

since, as Pomet points out, his was carefully prepared with aromatic herbs and hence made a more savory and marketable product withal.

Franklin (p. 94) gives some rather careful directions for the proper selection of mummy. He says, " In the first place one does not excavate into any but the sepulchres of kings and noble personages, and then the mummy administered in a drinking potion has marvellous curative powers. But it is not advisable to open the coffins of the poor devils who have (Jean de Renou, p. 433) succumbed to death through leprosy or pestilence, because of the cadaverous rottenness with which the corpses drip, nor is it right to tell the article as true and legitimate ' Mumie.' " Tomlinson, in his translation of the works of the above author, says the apothecaries became so greedy to supply the enormous demands for mummy flesh, that they went so far as to throw salt and alum on the carcasses of the French who had died of leprous infection, and then sell them for the genuine article. They even dared gather the corpses of those suffocated in the Arabian sands and sell them to customers as true " Mumie " to be taken internally. In fact, he says, " There are those still who have seen so little of the genuine they really believe mummie is the cadaverous and dry flesh of corrupted and putrid bodies." Such, he maintains, " is kept in apothecary shops to men's greatest peril, which wise men never use in medicine." For, to him, it was absurd to think the substitute efficacious for those " hurt by falling, for it would rather harm them." Posca and oxymel seemed infinitely better to him for such cases.

Wootton further infers that the employment of mummies as a medicine was not an overly ancient custom. To substantiate his claim he cites Chambers' Cyclopedia. Here may be found a remark to the effect that the first use of mummies was accredited to a Jew physician. Whether or not the article was introduced as a medicine maliciously against the Christians, appears to be an open question. Certainly the chief trade in this commodity was carried on by the Armenians and Jews. Pomet, it seems, knew a certain Guy de La Fontaine, royal physician, who once visited Egypt, and while there made observations on the subject. After some parlance with a certain Jewish merchant, he was admitted into the recesses of the latter's shop. There he observed a number of bodies stacked one upon the other. The merchant volunteered they were corpses which he had procured, some having diseases and some being without contamination. These latter he carefully treated with drugs and pawned off to the " trade " as the genuine mummie.

The better to guide the prospective purchaser, Pomet warns him to choose the shiny, black powder made thereof and not the article which is full of bones. A good specimen, he states, is effective in preventing the coagulation of blood.

Pare, a predecessor of Pomet, also had misgivings as to the entire genuineness of the article as offered on the market. He thought most of the bodies were stolen from gibbets, opened and disentrailed, then dried and dipped in pitch. That such a state of affairs was not wholly unknown to the mediæval druggist, is plain from a citation by Oswald Crollius, who goes so far as to offer a formula for preparing artificial mummie, viz., " A young red-headed man (since so many of the genuine had red hair) unburied and macerated in cold water for twenty-four hours," etc. This formed an excellent remedy for wasting of the flesh, ulcers, phthisis, so he states. A somewhat similar formula is cited by Handerson (in Baas' History of Medicine). Here a red-headed, uninjured specimen is again called for, with the variation that he is to have been broken on the wheel, or impaled, upon whom the moon and the sun have shone once, etc. It may be readily seen how closely these various formulas tallied with one another. This leads us to believe that they all took their origin from a common source.

There were, however, many other things, perhaps equally as popular, pertaining to the human body, of which much use was made. Secundine was often prescribed in cases of epilepsy. It was used in " Powder de Guttetta." The secundine is early referred to in the Anglo-Saxon books on leechcraft. . . . . In France, Lemery felt he could recommend the article without reserve. . . .

Whatever apparent deductions the mediævals may have apparently made in such matters, they were merely of a felicitous nature and not conclusive researches based upon keen deduction and experimentation. As a good illustration of my point, I might cite the frog. In the middle ages, and, in fact, down to the eighteenth century, frog skins, and also toads, were employed in certain medicines. Whether they were then efficient or not, concerns us little here. We now know that in the skin of the toad there is to be found a digitalis-like principle, highly effective under certain conditions. That they knew nothing of this hidden property can, I believe, be proved unquestionably. The majority of the animals formerly used in medicine were prescribed for reasons based upon superstition, and, let us call it, mediæval unenlightenment. The few marked exceptions to this list were such as could hardly be overlooked even by the most ignorant. Cantharides, for instance, was known and correctly used from the modern standpoint. The propensities of the Hymenoptera for raising the mischief could scarcely be overlooked by even the most ignorant of peasants.

FROGS AND TOADS.

Above, mention is made of the frog and toad. Tomlinson devotes an entire chapter to the setting forth of numerous recipes. A decoction of frog eased the toothache, and brought back, when used with pitch, the falling hairs. Skins were also antidotal for serpents' bites. Because of their breeding habits, an alchemist prescribed " water of frog's sperm for pimples and sore eyes." Others, at the same time, were rather skeptical on the subject, saying of him who searched for the spawn, " Whereas he might hunt, exenterate, dissect, exhaust and search the seminals of all the frogs in the kingdom of France and never get so much sperm as might wet the bottom of his metal pan." Pharmacopœia Londinensis says the " liver of a frog being dried, helps the quartan ague, or as the vulgar call it, the three-day ague." Lemery cites it as helpful in exciting sleep, viz., " Take 10 or 12 living frogs, cut them in pieces and place them in a pot." Another formulary bakes the toad and hangs it up in a linen bag about the neck as an amulet. A live toad, or one dried, does equally well, it tells us. Nose-bleed could be cured supposedly by clipping off the nails of a toad and hanging them around the neck of the patient, whereupon the quartan ague would be " rid away forever." This latter remedy evidently dates back to the precepts of Pliny. In the Pharmacopœia Extemporanea of Fuller, " frog spawn " forms a part of the styptic draught against hemorrhages, overflowing of the menses, and vomiting of blood. It was likewise used as a " refrigerating gargle " in cases of a burning fever. Of a more savory sound, if not of taste, was the " julep with houseleek," used to alleviate the thirst and check " the estuosity of the boiling blood."

Thus, in examining the various formulas, we are struck with the fact that, in many cases, although a general discrimination was drawn, frogs and toads were more or less interchangeable, so far as their reputed virtues went. In recent researches conducted on the physiological chemistry of the toad, the parotid glands have been found to contain the above-mentioned digitalis-like principles called " bufagin," together with a toxic principle in the skin, given the name of " bufonin." A further discussion of the respective properties of these drugs, together with

their pathological importance, lies rather in the field of chemistry than in a historical treatise.

Owing to the widespread popularity of the hundreds of animal parts and excretions, many druggists grew wealthy by taking advantage of their opportunities. A woman apothecary, in particular, availed herself of the chance.

Culpeper, so early as 1653, showed a marked aversion to the College of Physicians because they insisted in embodying these disagreeable recipes in the official pharmacopœia. While somewhat outspoken, this commentator, by his lively criticisms, did much toward modernizing the pharmacopœia. In looking through the old leech books, one is struck, not only with the oddness of the remedies, but with the rank foolishness as well, upon which they were based. To the prescription " Oleum Vulpinus," calling for a fat fox of middle age caught by hunting in the autumn, cut in pieces, Culpeper adds, " That was well put in therefore when you have caught a fox, bring him alive to the college and let them look in his mouth and tell you how old he is and so shall your Oyl be cum privilegio." He saw all too perspicaciously for his generation. He was far too sagacious for the follies of the Collegii Londinensis.

CONCLUSION.

A review of the whole field establishes, the more firmly, justification for my earlier remarks concerning the intellectual twilight pervading mediæval history in general, and the development of drugs in particular. Pharmacy labored under the yoke of superstition and mysticism until a comparatively late period. Many of the former remedies have been proved of some worth. Many more have been thrown out as worthless. The greatest error our ancestors made lay in their attempts to cure like with like. For instance, if a man became afflicted with a weak heart, they prescribed a remedy made from the beast whom they supposed must have the strongest organ. They therefore would commend the afflicted one to eat of the heart of the lion. Snake-bites were treated with pounded adder, and the bite of mad dogs, with worms taken from the tongue of the dog itself. At first thought we are very apt to believe these early physicians and pharmacists had some inkling of the modern toxin principles and theories. Yet, this is not at all the case. We may be certain that, whatever convictions they may have had in the realm of experimental medicine, their subsequent treatment was entirely without the cognizance of any of our present antitoxic practices.

Furthermore, from a list of over two hundred and fifty animal drugs (not to mention excretions and secretions numbering at least half as many more) of the earlier pharmacopœias to about two hundred by the year 1667, by 1710 the list had decreased to but seventy-five. This decrease has steadily been going on until there are now but a score. Whether to-day the pendulum is swinging back, is a question. To-morrow, who knows but we may be making " official " all manner of serums, etc. Already there have been several new serums added to the current pharmacopœia. We must not think this is a reversion to the primitive days of Dioscorides, Galen, Charas, Pomet and Hartmann. Quite the contrary is the case. Superficially, the trend may seem to be a recapitulation of the old animal drugs of mediæval England and France, but only superficially. Students of sociological development, and those interested in the curious animalic lore of early pharmacy, will find the subject the more entrancing, the more the breach between the ancients and the moderns is apparently narrowed in the eyes of the layman, and yet, in reality enormously widened to the investigator in bacteriology and organic pharmacy.

BIBLIOGRAPHY.

Cambridge History of English Literature, vol. i, p. 149–150.
Etymological Dictionary, Skeat.
Anglo-Saxon Leechcraft, Wellcome, A. M. A., 1912.
Med. Eng. in the Anglo-Saxon Times, Payne, p. 13.
Brief History of the English Language, Emerson, p. 25.
Med. Eng., Bateson, p. 76.
Eng. Wayfaring Life in 14th Century, Jusserand, Chap. I.
Encyclopædia Brit., Pharmacy, etc.
Chronicles of Pharmacy, Wootton, vols. i and ii.
La Vie Privée, etc., par Franklin, Alfred, Les Médicaments.
Life and Manners in Later Middle Ages, Abram.
Trans. of Works of Joannes Renodæus, Tomlinson, vol. iii.
Medicina de Quadrupedibus, Sextus Placitus, Trans. by Cockayne.
Leechdoms from Flyleaf of MSS., Trans. by Cockayne.
Peri Didaseon, Trans. by Cockayne.
Lacnunga, Trans. my Cockayne.
Book in Cleveland Medical Library, Title-page Missing, D192.
Baas' History of Medicine, Translated by Handerson.
Pharmacopœia Londinensis, notes by Nich. Culpeper, 1653.
Historische Studien a. d. Pharmakologischen Institute, Kobert, vol. iii.
Pharmacopœia Extemporanea, Body of Precepts, Fuller, 1710.
Chambers' Cyclopædia. See Index Title.
Pharmacopœia Londinensis, with notes by Nich. Culpeper, 1667.
Histoire Générale des Drogues. Pierre Pomet, 1694.
Dictionnaire Universel des Drogues Simples, Lemery, 1733.
Pharmacopœia Collegii Londinensis, Anno MDCLXXX.
The Works of Andrew Boorde, Dating about the First Half of the Sixteenth Century, Ed. by Furnivall, E. E. Text. Society.
Manners, Customs and Dress During the Middle Ages, Lacroix.
British Pharmacopœia, 1885.
British Pharmacopœia, 1898.
Complete History of Animals and Minerals, Robert Lovell, 1661.

SCIENTIFIC SECTION

DISCOVERY OF THE ALKALOIDAL AFFINITIES OF HYDROUS ALUMINUM SILICATE.*

BY JOHN URI LLOYD, PHAR.M.

TABLE IV.

(1)	14 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(2)	22 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(3)	50 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(4)	60 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(5)	60 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(6)	70 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(7)	70 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(8)	100 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(9)	100 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(10)	100 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(11)	110 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(12)	120 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(13)	150 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(14)	150 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(15)	150 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(16)	150 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(17)	150 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(18)	204 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(19)	800 Gm.	were required to precipitate 1 Gm. quinine bisulphate.
(20)	1000 Gm.	were required to precipitate 1 Gm. quinine bisulphate.

To the surprise and disappointment of both Dr. Parsons and myself, the alkaloidal affinities of these various specimens did not parallel their decolorizing qualities, as determined by Dr. Parsons. For example, one specimen that stood very high as a decolorizer was very low as regards alkaloidal affinities. Nor were colloids prepared by me from other sources capable of paralleling each other in adhesion intensity for different alkaloids, as shown in Table V, following.

TABLE V.[25]

Comparative Energies of Two Specimens of Colloid from Fullers' Earth.

	Amount required. First source.	Second source.
1 Gm. cocaine hydrochlorate	13 Gm.	10 Gm.
1 Gm. strychnine sulphate	11 Gm.	10 Gm.
1 Gm. morphine sulphate	6 Gm.	4 Gm.
1 Gm. brucine sulphate	9 Gm.	6½ Gm.
1 Gm. codeine sulphate	5 Gm.	5 Gm.
1 Gm. quinine bisulphate	15 Gm.	8 Gm.
1 Gm. cinchonine sulphate	10 Gm.	10 Gm.
1 Gm. cinchonidine sulphate	9 Gm.	10 Gm.
1 Gm. atropine sulphate	8 Gm.	8 Gm.

* Continued from p. 390, April issue.

[25] Of the whole line of perplexities and possibilities, the most perplexing problem to me is perhaps the evidence of such discordant results as shown in Table V.

Note the remarkable variation in the amount of colloid required to precipitate the *same amount* of a given alkaloid. While in general the reagent obtained from the second source is noticeably more energetic than from the first source, they are alike in energy as regards their reaction with atropine sulphate, codeine sulphate and cinchonine sulphate, while with cinchonidine sulphate the first colloid is more energetic than the second!

What is Fullers' Earth?—Some specimens of "fullers' earth" are of no alkaloidal value whatever, while some that rank well in this respect are naturally so foul and dirty as to forbid the very thought of putting them into the stomach. Dr. Parsons writes as follows:

Though samples of fullers' earth from different parts of any one deposit, or indeed from any one locality, are much alike, samples from different localities are so different in their physical properties that it is by no means easy to classify them. To determine whether or not a particular clay is a fullers' earth is no simple matter, for its bleaching power is practically the only characteristic by which it may be identified. Among the properties formerly attributed to fullers' earth are non-plasticity, disintegrating in water, detergent action, large water content, and the property of adhering to the tongue.

In this Dr. Fantus also agrees, as evidenced by the following, from his most recent article:

The power of adsorbing alkaloids is strongly developed in some fullers' earths, and very feeble in others. The adsorptive value of commercial fullers' earths should be stated by the dealers; and pharmacists should demand specimens of high activity. Lloyd's reagent possesses this power to the highest degree.

Fullers' earth is not synonymous with kaolin, as the United States Dispensatory and the National Dispensatory would lead us to infer. It is a substance with markedly different properties.—*Jour. Amer. Med. Assn.*, May 29, 1915.

Analyses of Fullers' Earth and Related Clays (by Mr. A. F. Price).—During my search for American fullers' earths capable of yielding the active colloids, Dr. John H. Dawson, of the United States Customs Service, San Francisco, introduced me to Mr. A. F. Price, who has had great experience in the analysis of clays and minerals of the West, and whose father (Professor Thomas Price) was celebrated in earth and mineral analyses. Mr. Price entered with enthusiasm into the subject, both because of his hope of developing a new process of clay valuation, and because he had long been professionally confronted with the commercial uncertainties of fullers' earth. He had already decided that the useful substance contained therein must be considered from its physical or colloidal aspect, and that chemical analytical processes were inadequate as standards of commercial valuations. He also described the processes of making from crude clays and clay mixtures the commercial, powdered fullers' earth, as follows:

Treatment of Fullers' Earth.—In this method, even those portions of the strata of fullers' earth which are now commercially valueless can be utilized. The different qualities of fullers' earth are thoroughly mixed, blended and amalgamated by grinding them, with the addition of water, to a slurry. The slurry is run into reservoirs, and allowed to settle. All water rising to the surface is removed and the residue is dried. The product is of uniform strength, quality and color.

Machine for Washing and Refining Fullers' Earth, China Clay, etc.—The fullers' earth is placed in a tank and mixed with water; it then goes to a second tank provided with an agitator to complete the mixing; and then to a refining machine consisting of two stationary concentric cylinders and an inner vessel like an inverted cone, having slots in, and projecting strips on, its sides. By the rotation at about 100 r.p.m. the coarser particles are driven against the walls of the inner cylinder and fall on the bed plate at its base, whence they are swept into the

annular space between the two cylinders by curved radial arms revolving with the inner vessel, and can be removed from time to time. The finer particles remain in the inner vessel, whence they flow into the settling tanks.

Mr. Price supplied me with a number of analyses of fullers' earths, made by his father and himself. These, in the paucity of published analytical reports, I include herewith. But as yet I have had no opportunity of paralleling these assays with an examination for their alkaloidal affinities.

Analyses, by A. F. Price, of Samples of Material Received from The Associated Oil Company.

February 3, 1911.

	No. 1. Percent.	No. 2. Percent.	No. 3. Percent.	No. 4. Percent.	No. 5. Percent.
Silica	52.89	55.73	54.25	58.15	54.08
Alumina	23.81	25.33	26.76	24.64	24.07
Ferrous oxide	1.67	1.25	1.34	1.05	1.93
Calcium oxide	2.52	2.06	2.35	1.23	2.15
Magnesium oxide	3.05	3.10	2.41	2.15	2.20
Alkalies	1.04	1.31	1.38	1.18	1.08
Carbon dioxide	0.61	0.55	0.61	0.81	1.05
Water	13.85	10.05	10.25	9.97	12.50
	99.44	99.38	99.55	99.18	99.06

	No. 6. Percent.	No. 7. Percent.	No. 8. Percent.	No. 9. Percent.	No. 10. Percent.
Silica	54.36	54.73	54.35	55.89	57.28
Alumina	26.25	24.18	23.28	23.56	25.42
Ferrous oxide	1.78	1.02	2.12	1.23	2.01
Calcium oxide	1.32	3.61	1.83	2.31	2.26
Magnesium oxide	3.33	1.43	1.38	3.04	3.12
Alkalies	1.03	0.87	1.21	0.83	1.05
Carbon dioxide	0.85	2.83	trace	0.50	0.81
Water	10.55	10.65	15.10	12.10	7.60
	99.47	99.32	99.27	99.46	99.55

List of Analyses of Recognized Fullers' Earth from Well-known Localities, Submitted for Purposes of Comparison with Our Report of This Date to The Associated Oil Company.

February 3, 1911.

Fullers' Earth from South Dakota.

	Percent.	Percent.	Percent.	Percent.	Percent.	Percent.
Silica	68.23	60.16	56.18	55.45	57.00	68.72
Alumina	14.93	10.38	23.23	18.58	17.368	16.90
Ferrous oxide	3.15	14.868	1.26	3.82	2.63	4.00
Calcium oxide	2.93	4.96	5.88	3.40	3.00	4.06
Magnesium oxide	0.875	1.714	3.29	3.50	3.027	2.56
Water	6.20	7.20	11.46	8.80	9.50	8.10

It is claimed that the material from South Dakota is fully equal to English fullers' earth, three analyses of which are given below:

	Percent.	Percent.	Percent.
Silica	44.00	55.48	60.90
Alumina	23.06	19.16	18.34
Ferrous oxide	2.00	11.78	10.00
Calcium oxide	4.17	3.10	2.36
Magnesium oxide	2.00	3.71	1.52
Alkalies	....	....	1.72
Water	24.95	6.75	4.89

The following are analyses of fullers' earth from Florida:

	Percent.	Percent.	Percent.
Silica	60.53	55.05	59.02
Alumina	20.13	22.88	11.88
Ferrous oxide	....	7.47	7.14
Calcium oxide	2.57	4.77	6.48
Magnesium oxide	2.12	0.43	3.24
Water	14.75	10.42	11.13

Standard Analyses of Fullers' Earth and Various Clays.

	Bakersfield Fullers' Earth.	English Fullers' Earth.
	Percent.	Percent.
Silica	54.32	54.20
Alumina	18.88	14.30
Ferric oxide	6.50	6.30
Lime	1.00	1.25
Magnesia	3.22	2.72
Loss on ignition	11.86	17.44
Alkalies (by difference)	4.22	3.79

Kaolin Clays.

	Percent.	Percent.	Percent.
Silica	62.40	46.28	72.30
Alumina	26.51	36.25	18.94
Ferric oxide	1.14	1.64	0.40
Lime	0.57	0.192	0.58
Magnesia	0.01	0.321	0.39
Water	8.80	13.53	7.04

Sewer Pipe Clays.

	Percent.	Percent.	Percent.
Silica	57.10	63.00	59.56
Alumina	21.29	23.57	15.76
Ferric oxide	7.31	1.87	7.72
Lime	0.29	0.46	0.60
Magnesia	1.53	0.89	0.93
Water	7.35	6.45	7.70

Brick Clay.

	Percent.	Percent.	Percent.
Silica	52.30	71.56	42.28
Alumina	18.85	13.86	8.26
Ferric oxide	6.55	4.78	3.84
Lime	3.36	0.50	13.05
Magnesia	4.49	0.11	6.01
Water and carbonic acid	....	....	22.07

Analyses of Slip Clays for Glaze.

	Percent.	Percent.	Percent.
Silica	55.40	43.94	63.63
Alumina	14.80	11.17	13.57
Ferric oxide	5.80	3.81	7.77
Lime	5.70	11.64	2.55
Magnesia	2.48	4.17	1.47
Water	5.18	3.90	4.75

Clays for Hollow Bricks and Fireproofing.

	Percent.	Percent.	Percent.
Silica	52.22	57.57	51.90
Alumina	29.45	21.70	18.34
Ferric oxide	2.78	2.26	7.50
Lime	0.88	0.32	4.14
Magnesia	0.72	1.12	3.30
Water	11.10	6.78	7.39

	Pressed Bricks.		Clay for Paving Brick.	
	Percent.	Percent.	Percent.	Percent.
Silica	65.78	68.28	56.00	74.25
Alumina	14.79	18.83	22.50	22.33
Ferric oxide	8.03	2.60	6.70	5.75
Lime	0.54	0.70	1.20	3.42
Magnesia	1.42	0.13	1.40	3.47
Water	4.68	7.81	7.00	1.13

Bentonite Clay.

Used for the manufacture of both ordinary and pressed bricks (and having none of the properties of fullers' earth).[26]

	Percent.	Percent.	Percent.
Silica	59.78	61.06	63.25
Alumina	15.10	17.12	17.62
Ferric oxide	2.40	3.17	3.70
Lime	0.73	2.69	4.12
Magnesia	4.14	1.82	3.70
Water	16.26	....	....

Well-known Fire Clays.

	Silica.	Alumina.	Water.	Balance.
	Percent.	Percent.	Percent.	Percent.
Stourbridge	65.10	22.22	7.10	5.57
	63.50	23.30		10.30
Dowlais	67.12	21.18	4.32	7.38
	58.10	26.59	7.57	7.74
French	63.57	27.45	8.64	0.74
Cornwall	47.75	38.11	12.54	1.30

To these analyses of commercial fullers' earths, I append Dr. Waldbott's analysis of "Lloyd's reagent," with his comments thereon, as follows:

The reagent has approximately the following composition: H_2O, 17.41 percent; SiO_2, 55.30 percent; Al_2O_3, 9.82 percent; Fe_2O_3, 14.18 percent; CaO, 1.58 percent; CO_2, percent not determined. Heating the material to about 130° did not destroy its peculiar activity; but a red heat expelled an additional quantity of water, rendering the reagent inert. When the reagent is exhausted with hydrochloric acid, the residual earth is still effective. The activity of the reagent is not impaired by concentrated nitric acid or by *aqua regia*. After the alkaloid has been removed from its combination with the reagent, the residual material retains the full effect. This process results in a jelly difficult to filter and slow to settle; it is precipitated readily by addition of an acid, or an alkaloidal salt. In drying, the jelly shrinks to a very small bulk; conversely, the solid expands remarkably in contact with water. The jelly precipitates inorganic salts also, *e.g.*, barium chloride, lead acetate, zinc sulphate, etc.[27]

[26] This statement is not correct if it is the bentonite I now know.—*A. F. P.*

[27] Journal of the American Chemical Society, vol. xxxv, No. 6, June, 1913.

The Term "Adsorption."—The nature of the alkaloidal reaction that I have considered under the word "*affinity*" may, I hope, be properly touched by me without intruding on scientific researches now being made by others. I have accepted that, for purposes of expression, this term "affinity" may be more restricted, by regarding the phenomenon as one of *adsorption.* I am the more inclined to this view, not only because the phenomenon seems *not* to be governed by atomic valency (see Table V), but because writers have always employed the word "*adhesion*" in connection with the attractive decolorizing action of fullers' earth. The *physical* condition of the material being all-important to the phenomenon points also in that direction. In this I take the liberty of extracting the following from a letter by my friend, Dr. R. G. Eccles, of Brooklyn, New York:

Adsorption is of exceedingly great interest in biology, and is at present commanding a vast amount of attention from physico-chemists. The word *adsorption* combines the two meanings of *adhesion* and *absorption.* The word *adhere* means simply to stick to, as by the use of paste, glue, or atmospheric pressure of a leather sucker to a stone. The word *absorb* applies to the taking up of a solution by blotting paper or a sponge. *Adsorption* does not appear to be either *adhering* or *absorbing,* but more like the taking up of hydrogen by platinum sponge, or like the precipitating and coagulating of colloidal proteins by contact with reacting agents of a chemical kind. It manifests at one and the same time a resemblance to *adhesion* and *absorption.*[28]

The eminent authority, Dr. Gordin, has used no other expression relating to this phenomenon, to which I may add that Dr. Wolfgang Ostwald,[29] of the University of Leipsic, Germany, who in the spring of 1914 spent some time in my laboratory, studying several phases of mutual interest in the direction of capillary and colloidal phenomena that my special line of researches had developed, accepted that view of the reaction. And yet, more than one phase of the subject still proves to me very perplexing. For example, the alkaloid sanguinarine is insoluble and white, but produces *red salts.* A mixture in water, of *white,* ammonia-made Lloyd's reagent, insoluble, alkaline, with *white* sanguinarine (practically insoluble) produces gradually a *red* alkaloidal compound, insoluble in dilute acid water. If this phenomenon be adhesion, *purely,* the reagent has the power of reddening this white alkaloid, giving to the adhesion product the color of the *salts* of sanguinarine. As a contrary view, may I not call attention to some of the phases of manipulation aforenamed, that seem to show that no exact chemical valency exists (see Table V)?

But I must not intrude further, for all such problems and outreaches are (or will be) in the hands of special investigators. This contribution is intended to introduce only enough chemistry and physics to elucidate the various problems I had to meet, in the face of lack of print or personal knowledge of anyone. The alkaloidal affinities of the substance under consideration seemed to be unknown.

[28] From letter of Dr. R. G. Eccles, Brooklyn, N. Y., June 21, 1915.

[29] After returning to Germany, Dr. Ostwald obtained from me considerable amounts of this reagent. He instituted systematic researches in the University laboratory, being deeply interested in the subject. Dr. Ostwald is also an officer in the German Army, and is now serving in the trenches.

Editor's Notes.—Last month Professor Lloyd lectured in several Colleges of Pharmacy and demonstrated the action of hydrous aluminum silicate with alkaloids. A series of slides were projected on the screen, showing several of the alkaloids in the magma, in their development from a colloidal condition to crystalline forms.

Related contributions by Professor Lloyd that appeared in the Proceedings of the American Pharmaceutical Association from 1871 to 1885 will be translated (part have been), for publication in the Zeitschrift für Chemie und Industrie der Kolloide.

CONTRIBUTED AND SELECTED

THE PHYSICAL SIGNIFICANCE OF EMULSIONS.*

BY LEO ROON.

Colloid and physical chemists have for many years, and especially so in recent years, carried out many investigations on emulsions with the idea of bringing to light the many missing links in the emulsion theory chain.

On the other hand, the pharmacists have done excellent work on emulsions for a greater number of years, but this was purely on the practical side. It is of interest to note, however regrettable, that the younger generation of pharmacists does not attempt to contribute even to our practical knowledge of the subject. This was brought out by a perusal of the proceedings of the American Pharmaceutical Association, which reveals the fact that almost all emulsion experimentation by pharmacists was done in the period between 1870 and 1900, and practically no work of value has been done since.

Therefore, for the explanations of the " why " of emulsions, we must of necessity turn to the physical chemists, and then, having in our minds a bird's-eye view of what they have tried to explain, perhaps we shall be able to apply *their theory to our practice.*

The object of this paper, then, is to give a brief résumé in chronological order of the development of those portions of the theory of emulsification which might be of practical application and of general interest to the pharmacist.

Several terms, which will appear frequently in this paper, will be defined first:

Each different, homogeneous part of a system is called a *phase.* For instance, pure water and olive oil are two different liquid phases.

If we now add the oil to the water and shake vigorously, we obtain a very fine distribution of a liquid phase (olive oil) in another liquid phase (water). Such a heterogeneous system is called an *emulsion.*

The phase which is divided into small separate volumes (in this case, the olive oil) is called the *disperse phase.*

The phase in which the disperse phase is distributed (in this case, the water) is called the *dispersion medium.*

The surface of a liquid has different properties from its interior, and acts like an elastic bag, tending to diminish the surface area. This effort or force exerted to diminish the surface of a liquid is its *surface tension.*

In adding to water as little as 0.01 percent of soap, the surface tension of water is decreased to 40 percent of its original value. If to such a solution oil is added and the mixture shaken, the tendency for the oil globules to gather together and the water particles to gather together is diminished. Substances, such as soap, that lower surface tension also cause *surface concentration,* and this phenomenon is an important factor in stabilizing emulsions, as will be shown later.

Surface tension $\times$ surface = surface energy.

For instance, 1 Cc. (mil) of oil has approximately a surface of 6 sq. cm. If this 1 Cc. (mil) of oil is subdivided into globules having a diameter of about 1 micron (1/1000 mm.), then that same quantity of oil has a surface of 60,000 sq. cm., or, in other words, if the surface tension has not changed, then the surface energy is now 10,000 times as great as before subdivision. This is evidenced in

* Read at the meeting of the American Pharmaceutical Association, New York Branch, April 10, 1916.

making an emulsion nucleus. The trituration at first is very easy. As the particles become more and more finely subdivided, the total surface, and also total surface energy, increase tremendously, and the work in trituration necessary to overcome the increased energy is very great indeed.

In 1870, E. v. Brucke[1] announced the fact that when rancid oil, or, in other words, oil containing free fatty acid, is shaken with a solution of sodium carbonate and certain other alkaline liquids, an immediate emulsion results. He believed that the oil was broken into fine globules by shaking, and that the soap formed served to hold the emulsion by preventing the oil globules from coming together.

In the same year, L. Plateau,[2] after investigating various emulsions, came to the conclusion that the formation of emulsions depends on low surface tension and a high viscosity, the decrease in surface tension permitting greater miscibility, and the high viscosity hindering the coalescence of the oil globules.

In 1873, Donath[3] made practical use of the formation of emulsions as a means of detecting adulterants. He boiled for five minutes a piece of beeswax, about the size of a nut, with a concentrated solution of sodium carbonate. If an emulsion remained on cooling, the wax was considered adulterated with rosin, tallow, stearic acid, or Japanese wax.

In 1878, Johannes Gad[4] called attention to the fact that, when oil containing the proper percentage of fatty acid was placed on the surface of a sodium carbonate solution a beautiful spontaneous emulsion resulted, and from this he held that neither shaking, nor any other outside mechanical force was necessary to the formation of an emulsion, but that the chemical force developed by the soap formation of itself was sufficient, under favorable circumstances, to break the oil drops into the finest emulsion globules.

Gad's method, used in his study of spontaneous emulsions, consisted in taking a series of watch glasses containing a 0.25 percent solution of sodium carbonate. Drops of oil containing different percentages of fatty acids were gently placed upon the surface of the solutions in the watch glasses, and the amount of spontaneous emulsification noted. Gad found, at room temperature under the conditions named above, that the oil which contained about 5.5 percent of fatty acid emulsified spontaneously, and that oils with very little more or less than 5.5 percent of fatty acid yielded incomplete emulsions. He therefore determined that the limits of good spontaneous emulsibility were not only constant, but quite narrow.

The essence of Schischkoff's[5] work, published in 1880, is as follows:

1. He found also that fats and oils with free fatty acid were emulsifiable with dilute alkaline solutions.

2. He could emulsify oil of turpentine, mineral oil, etc., by alkaline liquids, if a small amount of stearic acid were added to the oils.

3. He observed that butter fat, freed from free fatty acid, could not be emulsified by an alkaline liquid.

4. Finally, he discovered in whey an albuminoid, which is different from common albumen and casein. His synthetic experiments tended to show that casein, without this albumen, may form milk, but not cream.

In 1888, Quincke[6] discusses emulsions as follows:

"By shaking oil with soda or gum arabic solution, one can prepare emulsions which look like milk. When fatty oils are emulsified in soda solution, the coalescing of the fat globules is prevented by a thin layer of soap solution, any opening in which is at once closed by the molecular forces." He also shows in a table that the surface between the fatty oils and the gum arabic solution is less than the surface tension of the fatty oils against water. Further, he states that "if one shakes

together mercury, water and olive oil, there is formed a grayish-white viscous mass, an emulsion of mercury, formed of many small globules of mercury, each one covered with a film of oil. . . ." According to Quincke, "gray mercury salve is really an emulsion of mercury in viscous lard."

In 1891, Rachford [7] published an exceedingly interesting paper entitled, "The Influence of the Bile on the Fat-splitting Properties of the Pancreatic Juice," which, because of its wealth of emulsion study, will be briefly abstracted herewith:

Rachford employed in his experimental work Gad's method of determining the spontaneous emulsibility of oils. He showed that heating an animal or vegetable oil split off free fatty acid, so that a neutral oil, incapable of being emulsified with alkaline liquids, when heated, developed sufficient free fatty acid to form a good emulsion with sodium carbonate solution.

Rachford says, "It is a physiological fact beyond dispute that the splitting of fatty acids is a most important preliminary step in fat digestion. That the cooking of fats will develop in them fatty acids is therefore a fact of considerable physiological importance and one that, so far as I know, has not previously been noticed."

With these as preliminaries, the author goes on with his investigations with the pancreatic juice. He inserts a small glass cannula through the pancreatic papilla into the pancreatic duct of a living rabbit, and collects about 1 Cc. of juice "uniform and powerful in physiological action." He arranges a series of watch glasses with 0.25 percent sodium carbonate solution in them (Gad's method). Into a 2 Cc. tube, ⅓ Cc. of pancreatic juice and ⅔ Cc. of neutral olive oil is placed and shaken, and the oil allowed to separate. One drop of this oil is pipetted on the surface of solution in watch glass No. 1. The tube is shaken again, mixture allowed to separate, and a drop of the oil pipetted on solution in watch glass No. 2. This is repeated every three or four minutes until the experiment is completed. Gad had found that oil containing 5.5 percent of free fatty acid emulsified spontaneously in 0.25 percent sodium carbonate solution, and Rachford used this fact as a measure of the fat-splitting action of the juice. The results may be shown as follows:

Sodium carbonate solution, 0.25 percent, to which is added drop of

Oil with no fatty acid.....no emulsion.
Oil with steadily increasing amounts of fatty acid...more and more emulsion.
Oil with 5.5 percent fatty acid.....spontaneous emulsion.
Oil with increasing amounts of fatty acid.....less and less emulsion.
Oil split to all fatty acid and glycerin.....no emulsion, only turbidity due to soap.

All the oil is split to fatty acid and glycerin in one to two hours' action of the pancreatic juice.

"The action of the juice on most of the fats is rapid and complete. Castor oil is an exception to the rule, as only a very small quantity of acid is developed in it by the action of pancreatic juice for 5 hours at 37° C. Castor oil is therefore practically indigestible, and this may in part account for its cathartic action."

In 1898, Moore and Krumholz [8] published their paper "On the Relative Power of Various Forms of Proteid in Conserving Emulsions," in which their experimental data, dealing with emulsions made with white of egg, blood serum, acid and alkali albumen prepared from each of the above, and with Witte's peptone (chiefly deutero-albumose), shows an order of emulsifying value as follows:

Alkali and acid albumen .....very effective.
White of egg and blood-serum .....very little action.
Albumose .....practically inert.

The theory of emulsions interested Donnan[9] for a number of years, and, in a paper on soap emulsions, he says:

"The formation of emulsions of fatty oils and alkaline liquids is a phenomenon well known to physiologists. So far as I know, this subject has never received quantitative treatment, and there seems to be no general theory on the subject. . . . The problem is an especially interesting one, bcause it will probably lead some day to a rational theory of coloidal solutions."

Now, Donnan proceeded by taking a stop-cocked pipette with a curved tip, and filled it with rape-seed oil. This was lowered into water, the oil allowed to flow, and the number of drops rising to the surface counted. Additions of sodium hydroxide were made, and the effect noted as shown in table.

Rape-seed Oil and NaOH.

Gm.-mol. NaOH per liter.	No. of drops.
0	88
0.0008	213
0.0011	430
0.0013	stream

Similar results were obtained with sodium carbonate. From this we see that surface tension plays an important part in the phenomenon, and that this decreases very rapidly with increasing concentration of alkali.

Commenting on his result, Donnan says: "This decrease in surface tension is due to the formation of soap at the surface. . . . At first one might be inclined to suspect a surface saponification of the glyceride, but most of the textbooks on physiology state that the natural oils almost all react acid and that the emulsifying action of the alkaline liquids is the result of the formation of soap by simple neutralization (of the free fatty acid)."

To prove this view, Donnan prepared an absolutely neutral olive oil and repeated the above experiments with these results:

	No. of drops in water.	No. of drops in N/1000 NaOH.
Commercial oil (acid reaction)	58	331
Purified oil (neutral)	55	58

The difference in the number of drops of the neutral oil is negligible.

Treating a neutral hydrocarbon of the paraffin series in the same way, he got no appreciable increase in the number of drops with alkali. However, on dissolving 0.6 percent of stearic acid in the hydrocarbon, soap was formed and the number of drops increased.

	No. of drops.
Pure hydrocarbon:	
In water	47
In N/100 NaOH	52.7
Pure hydrocarbon with 0.6 percent stearic acid:	
In water	48.5
In N/1000 NaOH	320.0

In 1903, Hillyer,[10] in his study of the cleansing power of soaps, discusses emulsions on lines similar to those of Donnan. He brings out the fact that a soap solution, even though very dilute, has a lower surface tension than any other aqueous liquid, its surface tension being only 40 percent that of pure water.

"Can emulsification be explained by the viscosity of the emulsifying agent? In the case of very thick liquids, like the gum solutions used by the pharmacists, it is

probable that the extreme viscosity is a very large factor in giving permanence to the oil droplets which have been formed mechanically. That even very large internal viscosity will not make a permanent emulsion is shown by the fact that 50 percent glycerin, or 6 percent gum solution, will not emulsify kerosene or a viscous oil, like cotton-seed oil. Saponin or albumen solution with high surface viscosity will give permanent emulsions. Dilute soap solutions, which have not a great viscosity, have very great emulsifying power, and the same is true to a less degree of some other solutions. From these facts it must be decided that internal viscosity of a liquid will not account for its emulsifying power."

Hillyer's conclusion is " that emulsification is largely due to the small surface tension between oil and emulsifying agent, which allows the emulsifying agent to be spread out in thin films, separating the oil droplets. The surface tension is not strong enough to withdraw the film from between the droplets except slowly, and if the emulsifying agent has shown great internal viscosity, or if great surface viscosity is shown between the liquids, the thinning out of the film becomes so slow that the emulsion is permanent."

In 1907, K. Beck [11] made a study of emulsions of gum arabic solutions with castor oil, and noticed, on mixing the two, a great increase in viscosity. He believes the increase of viscosity to be due to surface forces which only become important when the water particles are distributed as very fine particles through the oil, since the water, before that, moved through the oil without hinderance under the influence of gravity.

An exceedingly fine contribution to the theory of emulsification was made by Pickering [12] in 1907, but, due to the length of the paper, only a few important points can be brought out here. Many of his emulsions were made with a solution of soft soap as the emulsifier, and it is interesting to note that he was able to obtain with it an emulsion containing as high as 99 percent of paraffin oil. Pickering tried solutions of glue, starch, egg-albumen, saponin, etc., as emulsifiers, but he found that none gave emulsions of such fine texture as soap.

" The basic sulphates of iron and copper are among those substances which give excellent emulsions. They may be formed by adding lime, or lime-water, to the normal sulphates, and then the paraffin oil, when the slightest churning, or even shaking, of the mixture, produces emulsification. Besides the ease of manufacture, and the absence of spontaneous de-emulsification, these emulsions possess the advantage of not being decomposed by the addition of caustic soda. . . . When the copper salt is used, the emulsion possesses all the fungicidal properties of Bordeaux mixture."

Based on his experimental data, Pickering has classified the emulsifying agents under three heads according to their value. We quote what he has to say about good emulsifiers:

" *Good Emulsifiers.—Among soluble, or partially soluble substances,* soft soap seems to be the best; dissolved starch, milk and flour are good, although the latter forms a flocculent, not a creamy, emulsion, and milk gives rise to solid clots; glue emulsifies well, and so does egg-albumen, but the emulsion of the latter is rather frothy, owing to enclosed air bubbles; saponin and quillaya bark give good emulsions when the proportion of oil present is not large.

" *Among the insoluble emulsifiers,* the basic sulphate of iron is the best, followed by those of copper and nickel; the basic sulphates of zinc and aluminum give good emulsions at first, but aggregation of the particles seems to occur, and causes partial de-emulsification. Ferrous hydroxide and higher hydrated oxides of iron are good. The precipitate obtained by adding sodium carbonate to copper sulphate is a

very good emulsifier, so are calcium carbonate and arsenate when first precipitated, but the latter soon becomes crystalline and de-emulsification follows; lead arsenate, freshly precipitated, is good, and zinc oxychloride, or basic chloride, is fair, although the emulsion with it is somewhat flocculent; some fine clays (unheated) give good emulsions, but they naturally contain many gross particles which sink to the bottom unemulsified; ferrous hydrosulphide gives a good emulsion if the proportion of oil present is small."

Holde[13] shows that lime and alumina soaps are used in lubricating greases, but of this very interesting paper, we can quote but a few lines.

"Though the composition of these greases varies somewhat, most of them consist of a solution of lime soap (15–23 percent and sometimes more) in a heavy mineral oil with the addition of a little water (sometimes as little as 0.5–0.7 percent, but usually 1–4 percent).

"The lubricating greases offer a series of interesting problems in physical chemistry, which have not yet been studied from a scientific view-point.

"Observations show that the water is usually present in a state of very fine mechanical subdivision. This much is certain, that a small amount of water is necessary in the grease to produce satisfactory permanency, since all greases that do not contain water soon become inhomogeneous. As technical men say, they let go of the oil."

Another instance in which water is the disperse phase is to be found in the case of mixed paints. Toch, in "The Chemistry and Technology of Mixed Paints," is quoted here.

"The manufacture of mixed paints is essentially American, having been accredited to some enterprising New Englanders, who observed that when linseed-oil paint was mixed with a solution of silicate of soda (water-glass), an emulsion was formed, and the paint so made showed very little tendency to settle or harden in the package. Several lay claim to this invention. The first mixed paint was marketed in small packages for home consumption and appeared about 1865.

". . . A mixed paint should not contain over 2 percent water, for it is unnecessary to add more than this amount to any paint.

"The materials used for 'emulsifying' paint are the carbonates of all the alkalies, borax, zinc sulphate, calcium hypochlorite, manganese sulphate and chloride, ferric chloride, lead acetate, ferrous sulphate, alcoholic solutions of these various salts, also the alcoholic solutions of these salts containing a small percentage of moisture."

In working with soap emulsions, Donnan found that the salts of the lower fatty acids, formic, acetic, butyric, etc., had not the same action in reducing surface tension as have salts of oleic, stearic and palmitic acids. This very interesting fact was also observed in 1908 by Mayer, Schaeffer and Terroine.[14] The alkali salts of the lower fatty acids, formic, acetic, etc., form homogeneous, optically empty solutions, while in the neutral solutions of capronic, caprylic and lauric acids, ultramicroscopic suspensions are to be observed. "When considering aqueous solutions of the alkali salts of the normal saturated fatty acid, we are not far from the truth when we say that 'soapiness' begins about with caprylic acid and is clearly marked with lauric acid." It would seem from this that only those fatty acid salts that lie in the realm of colloids have the property of soapiness, and the ability to emulsify.

In 1909, Lewis,[15] a worker in Donnan's laboratory, discusses in his paper another side of the general theory. "He worked with an emulsion of mineral oil in water because that eliminated secondary reactions. He appears not to have added

any third substance intentionally, which perhaps accounts for his getting only weak emulsions." He simply shakes the oil with water in a mechanical shaker for 48 hours, and gets an emulsion, whose oil particles exhibit Brownian movements and other phenomena similar to that shown by colloidal metals.

In 1910, Robertson [16] published some results on emulsions of olive oil and water which are of special interest because he succeeded in obtaining an emulsion of water in oil. We quote a portion of his article.

" If one shakes up, thorougly, equal parts of slightly alkaline water and olive oil, a very stable emulsion is formed in which the olive oil forms the internal phase, and water the external; that is, the olive oil is suspended in the form of spherical droplets within the water. If we decrease the proportion of water, the resultant emulsion still continues to consist of droplets of oil suspended in water until the proportion of water to oil reaches a definite critical value. When this critical ratio is reached, the character of the emulsion undergoes an abrupt change. From being a viscous, creamy-white emulsion of oil in water, it becomes a fluid, yellow emulsion of water in oil. The oil is now the external phase, and the water the internal phase. One can readily detect which phase of the emulsion is external, without microscopic examination, by means of the following simple device: The bright red dye Soudan III is insoluble in water, but readily soluble in oils; on sprinkling a few grains of Soudan III on the surface of an emulsion of water in oil, the color rapidly spreads over the surface. If, however, one sprinkles the Soudan III on the surface of an emulsion of oil in water, the color remains confined to the droplets of oil with which the grains are in actual contact, since it cannot spread from them to the adjacent drops through the intervening water."

In 1910, Pickering [17] published another paper in which he brings out the rather startling fact that potassium cupric tartrate will emulsify a mixture of alcohol and water, even though we know them to be miscible in all proportions. Bancroft found on trying this that the potassium cupric tartrate causes the aqueous alcohol to separate into two layers. Thus, he shows that it is evidently possible to make emulsions of acetone in water by first adding some such salt as potassium carbonate to cause the formation of two layers, and then adding a suitable emulsifying agent.

Based on his experimental data in this and in his former paper, Pickering sums up his notion of the effect of surface tension and viscosity in the formation of emulsions.

" The conclusion to be drawn is that emulsification may take place in a liquid when the viscosity is not high and the surface tension is not low, though it is admitted that a high viscosity and a low surface tension often facilitate the formation of emulsions. The only, or rather chief, cause of emulsification seems to be the presence in the liquid medium of small insoluble particles, which form a film around the drops. In order that such particles have the power of forming an emulsion, they must have only a slight tendency to agglomerate, they must be more readily wetted by the water than by the oil, and they must not be crystalline."

A few months later, Donnan [18] comments on Pickering's paper as follows:

" In a recent article, S. U. Pickering discusses the theory of emulsions, and apparently comes to the conclusion that surface tension has very little to do with the phenomenon of emulsification and that emulsions owe their formation chiefly to solid particles. S. U. Pickering has made no accurate measurements on this point and seems also not to know about the close relation between surface adsorption and lowering of the surface tension. He also does not consider the electrical forces which we know to be acting. We do not believe that the true nature of emulsions is explained by S. U. Pickering's theory of solid particles."

In 1911, Ellis [19] prepared theoretical emulsions of lubricating oil and water only, and worked on the electrical charge of the particles and their migration. The paper does not add much to our knowledge of actual emulsions, working as Ellis does with an emulsion containing only about one part of oil in 10,000 of water.

Pharmaceutical text-books invariably refer to milk as the type of perfect emulsion, and for this reason it is interesting to note what Bancroft [20] says on this point.

" It is a common thing for people to speak of milk as a perfect emulsion; but the facts do not warrant this. Cream starts to rise almost at once, and nobody would call a synthetic emulsion a success which went to pieces as quickly as milk does. By passing milk through a homogenizer, and thus decreasing the size of the globules, man improves on nature so far as the stability of the emulsion is concerned."

Bancroft [21] states that Mr. C. E. Swett called his attention to the fact that wool fat forms an emulsion with water in which water is present as the internal phase. He quotes Lewkowitsch in the " Chemical Technology and Analysis of Oils, Fats and Waxes." " Although insoluble in water, wool wax possesses the remarkable property of absorbing larger quantities of water than any other wax. The emulsion it forms with water has the appearance of a perfectly homogeneous mass. This wool wax can be mixed with as much as 80 percent of water."

Further on Bancroft writes, " It was also found that water emulsifies in commercial linseed oil, this undoubtedly being due to the rosin content of the oil. Since there are said to be 70,000,000 gallons of mixed paints used in the United States, this type of emulsion (water in oil) is unquestionably the more important one commercially, and it is rather extraordinary that the writers on emulsions should have overlooked this important industry."

F. R. Newman,[22] working in Bancroft's laboratory, did some admirable work in the study of the nature of emulsions and the identification of the phases. He brings out the three methods for determining which of two liquids is the external phase in an emulsion. They are the unsatisfactory inspection method, the fairly good Robertson's Soudan III dye method, which has already been taken up, and finally, Briggs' drop method. The latter consists in placing a drop of emulsion on a glass plate by means of a rod, and adding a drop of water on top of the drop of emulsion. The two are stirred together. If the emulsified globules spread in water, it is an emulsion of oil in water, but if there is no spreading, it is an emulsion of water in oil. The principle involved is that one can dilute an emulsion by adding more of the external phase.

Of the many other interesting points in Newman's paper, only a few can be taken up here. They are as follows:

" Magnesium oleate is the best emulsifying agent yet tried for making an emulsion of water in benzene. The emulsions are much more stable if a little sodium oleate is also present.

" In mixed paints, water is the internal phase and oil the external one. By shaking commercial white lead together with raw linseed oil and water, a water-in-oil emulsion was obtained containing 87.5 per cent. water and 12.5 per cent. oil by volume.

" Whether one liquid is emulsified in the second, or the second in the first, depends upon the nature of the emulsifier." A hydrophile (affinity for water) colloid, like gum arabic, sodium oleate, etc., will tend to make water the external phase. A hydrophobe (aversion for water) colloid, like magnesium oleate, rubber, etc., will tend to make water the internal phase.

In 1915, T. R. Briggs,[23] and a short time after, Briggs and Schmidt,[24] published

two very thorough pieces of work on benzene emulsions, although no new theory was introduced. Briggs also devised a simple method for homogenizing emulsions.

The last word in the theory of emulsions comes from no less an authority than Martin H. Fischer,[25] who, in conjunction with Miss M. O. Hooker, publishes in Science of March 31, 1916, an article entitled, "On the Physical Chemistry of Emulsions and its Bearing on Physiological and Pathological Problems," the details of which are soon to appear in the Kolloid-Zeitschrift. Fischer's article, in the estimation of the writer, is the most remarkable and most interesting paper contributed to the subject of emulsions, first, because of the formulation of a brand-new theory, and, secondly, because of its ingenious applications in physiological problems.

Part I consists of a brief discourse on our knowledge of the emulsion theories. It shows that the low-surface-tension theory, the high-viscosity theory and Pickering's theory of films of insoluble particles are admittedly inadequate, and that each plays its part in selected cases of emulsions.

Part II begins as follows: "In reviewing the empirical instructions available for the preparation of emulsions, and in our own attempts to formulate such as would always yield good results, we were struck with the fact that their production is always associated with the discovery of a method whereby *the water (or other medium) which is to act as the dispersing agent is all used in the formation of a colloid hydration (solvation) compound.* In other words, when it is said that the addition of soap favors the formation and stabilization of a division of oil in water, it really means that soap is a hydrophilic colloid which, with water, forms a colloid hydrate with certain physical characteristics, and the oil is divided in this. *The resulting mixture cannot, therefore, be looked upon as a subdivision of oil in water, but rather as one of oil in a hydrated colloid.*"

Part III deals with the cracking of emulsions, and this general statement is made: "An emulsion breaks whenever the hydrophilic colloid which holds the aqueous dispersion means is either diluted beyond the point at which it can take up all the offered water, or is so influenced by external conditions that its original capacity for holding water is sufficiently reduced."

Part IV deals with the application of this new theory to an explanation of fatty degeneration. In part it states: "While the fat in the cells of the body is not ordinarily visible in the state in which it exists there normally, certain pathological conditions popularly termed 'fatty infiltration' or 'fatty degeneration' suffice to make the fat readily visible. . . . In the majority of instances, chemical analysis fails to show that the affected cells contain any more than their normal fat content. *In essence, therefore, 'fatty degeneration' no longer represents a chemical, but a physical problem, which asks how a given quantity of fat usually so distributed in a cell as to be invisible, becomes redistributed in such fashion as to be readily visible.*

". . . Seven percent potassium soap and cotton-seed oil, for instance, are both relatively mobile liquids, but when mixed in proper proportion they yield an emulsion so stiff that it will stand alone. This is the analogue of the 25 percent emulsion of fat and lipoid which we call the brain. If the oil-in-soap emulsion is broken through the addition of a little acid, it yields an impure mixture of oil, water and precipitated colloid material—the analogue of the liquid contents found in any area of brain 'softening.'"

In the face of all this work which has been done on emulsions, is not our definition of an emulsion, as given in most pharmaceutical texts, wholly inadequate and entirely too narrow? We read in our texts that, "Emulsions are aqueous liquid

preparations in which oily or resinous liquids are suspended by the agency of gummy or viscid substances." Let us analyze the definition:

"*Emulsions are aqueous liquids.* . . ." The official hydrous wool fat is an emulsion of water (or, according to Fischer, an emulsion of a hydrated colloid) in wax. This is not an aqueous liquid. ". . . *in which oily or resinous liquids are suspended.* . . . " We have the official emulsion of chloroform, and surely chloroform is not an oily or resinous liquid. Also, as has been shown, many of our emulsions are suspensions of water in oils. ". . . *by the agency of gummy or viscid substances.*" . . . It has been seen that very dilute soap solutions, precipitates of basic sulphates, and many other substances which are not viscid or gummy, have been used as emulsifying agents with success. Their successful use in pharmacy is only a matter of experiment and application.

HAVEMEYER CHEMICAL LABORATORIES,
NEW YORK UNIVERSITY.

REFERENCES.

[1] Sitzungsber. Akad. Wiss. Wien., *61*, II, 362, 1875.
[2] Pogg. Ann., *141*, 44, 1870.
[3] Jour. Chem. Soc., *26*, 194, 1873.
[4] Archiv. Anat. Physiol., 1878, 181.
[5] Jour. Chem. Soc., *38*, 273, 1880.
[6] Wied. Ann., *35*, 589, 1888.
[7] Jour. Physiol., *12*, 72, 1891.
[8] Proc. Physiol. Soc., London, 54, 1898.
[9] Zeit. phys. Chem., *31*, 42, 1899.
[10] Jour. Amer. Chem. Soc., *25*, 513, 1903.
[11] Zeit. phys. Chem., *58*, 409, 1907.
[12] Jour. Chem. Soc., *91*, 2001, 1907.
[13] Zeit. Kolloidchemie, *3*, 270, 1908.
[14] Comptes rendus, *146*, 484, 1908.
[15] Zeit. Kolloidchemie, *4*, 211, 1909.
[16] Ibid., *7*, 7, 1910.
[17] Ibid., *7*, 11, 1910.
[18] Ibid., *7*, 214, 1910.
[19] Zeit. phys. Chem., *78*, 352, 1911.
[20] Jour. Phys. Chem., *16*, 367, 1912.
[21] Ibid., *17*, 501, 1913.
[22] Ibid., *18*, 34, 1914.
[23] Ibid., *19*, 210, 1915.
[24] Ibid., *19*, 478, 1915.
[25] Science, *43*, 468, 1916.

SOME EXPERIMENTS IN FILTRATION.*

BY WILBUR L. SCOVILLE.

It has long been known that in the filtration of solutions of solids through paper there is a slight absorption [1] of the solid by the paper and consequently a change in the strength of the solution. This absorption takes place from the first portion of the liquid which passes through the filter, and is so slight that it is disregarded except in close analytical work.

In pharmaceutical operations it is frequently necessary to employ a clarifying agent in addition to filter-paper, and it has seemed desirable to determine whether these agents have a material absorptive action on the solids, sufficient to make a real difference in the strength of the solution.

Since powders used in this way need a filter-paper also, the same size and grade of paper was used throughout the experiments, viz., a 5-inch white filter, holding, when filled, about two fluidounces.

Preliminary tests showed that 500 mils of water will pass through a paper of this size in 4 minutes, the same amount of alcohol in 8¾ minutes, and of diluted alcohol in 12 minutes.

Double filters required almost exactly twice as much time in each instance.

The clarifying agents chosen were paper pulp, purified talc, infusorial earth, and fullers' earth. Two hundred and fifty mils of solution was filtered through each of these, using 2 Gm. of paper pulp or 5 Gm. of powder for each experiment. The infusorial earth was free from carbonate, and yielded only a trace of soluble matter to water or diluted alcohol.

The conditions of filtration were the ordinary methods of pharmacy, the powder being mixed with about 50 mils of the solution and the mixture poured on the filter, to be followed as needed by the rest of the solution until all had passed through. Unless filtration was extremely slow, the funnel was not covered. Paper pulp was moistened with the solution, packed firmly in the apex of the funnel, and the solution poured upon it, no filter-paper being needed with this agent.

Three types of solutions were employed, namely, a neutral aqueous solution, an acidulated aqueous solution—usually containing one percent of citric acid—and a neutral solution in diluted alcohol.

The strengths of the various solutions corresponded to the usual strengths employed in pharmacy or medicine.

The following tables show the results, the strengths being indicated by grammes per 100 mils, and the changes in percentage.

* Read before the Section on Practical Pharmacy and Dispensing, A. Ph. A., San Francisco meeting.

[1] After considerable discussion of the paper a motion was passed asking that the Scientific Section take the matter of absorption in filtration under consideration and solicit papers on the subject.

Quinine Hydrochloride Solution, 2 Percent.

(Strength Stated as Anhydrous Quinine.)

(Acid Solution Containing 0.5 Percent Free Hydrochloric Acid.)

	Aqueous, Neutral			Aqueous, Acid			Alcoholic		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Paper pulp.....	1.706	1.706	00	1.700	1.696	− 0.2	1.672	1.624	− 2.8
Purified talc.....	1.706	1.676	− 1.1	1.700	1.690	− 0.6	1.672	1.670	− 0.01
Infusorial earth....	1.706	1.644	− 3.6	1.700	1.674	− 1.5	1.672	1.672	0.00
Fullers' earth.....	1.706	1.112	−34.8	1.700	1.326	−22.1	1.672	1.232	−26.2

Strychnine Sulphate, 1.28 Percent.

(Corresponding to 1.0 Percent Strychnine Alkaloid.)

(Acid Solution Containing 1 Percent Free Citric Acid.)

	Aqueous, Neutral			Aqueous, Acid			Alcoholic		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Paper pulp.....	1.000	0.989	− 1.1	1.000	0.995	− 0.5	1.000	0.995	− 0.5
Purified talc.....	1.000	0.996	− 0.7	1.000	0.996	− 0.4	1.000	1.009	+ 0.9
Infusorial earth....	1.000	0.973	− 2.7	1.000	0.960	− 3.5	1.000	1.046	+ 4.6
Fullers' earth.....	1.000	0.000	−100	1.000	0.000	−100	1.000	0.004	−99.6

Caffeine.

(Acid Solution Corresponding to Citrated Caffeine.)

	Aqueous, Neutral			Aqueous, Acid			Alcoholic		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Paper pulp.....	0.788	0.788	00	0.785	0.785	00	0.781	0.781	00
Purified talc.....	0.788	0.784	− 0.5	0.785	0.780	− 1.0	0.781	0.785	+ 0.56
Infusorial earth....	0.788	0.789	+	0.785	0.790	+ 0.6	0.781	0.783	+ 0.3
Fullers' earth.....	0.788	0.486	−35.3	0.785	0.466	−40.9	0.781	0.540	−31.5

Morphine Sulphate, 1.5 Percent.

(Corresponding to About 1.25 Gm. of Crystallized Morphine Per 100 Mils.)

	Aqueous, Neutral			Aqueous, Acid			Alcoholic		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Purified talc.....	1.242	1.2055	− 3.0	1.253	1.251	− 0.2	1.231	1.248	+ 1.3
Infusorial earth....	1.242	1.188	− 4.4	1.253	1.141	− 9.0	1.231	1.262	+ 2.5
Fullers' earth.....	1.242	0.700	−43.7	1.253	0.718	−42.7	1.231	0.757	−38.5

Atropine Sulphate, 0.7 Percent.

(Corresponding to 0.400 Gm. of Alkaloid Per 100 Mils.)

Agent	Aqueous, Neutral			Aqueous, Acid			Alcoholic		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Paper pulp.....	0.400	0.397	− 0.7	0.400	0.397	− 0.7	0.400	0.393	− 1.7
Purified talc.....	0.400	0.377	− 5.7	0.400	0.377	− 5.7	0.400	0.388	− 3.0
Infusorial earth....	0.400	0.361	− 9.7	0.400	0.380	− 5.0	0.400	0.415	+ 4.0
Fullers' earth.....	0.400	0.00	−100	0.400	0.00	−100	0.400	0.00	−100

Acetanilid.

	35 percent alcohol solution			49 percent alcohol solution		
	Original solution	Filtrate	Change, percent	Original solution	Filtrate	Change, percent
Paper pulp.....	.....	.....	.....	3.400	3.420	+0.5
Purified talc.....	3.420	3.260	− 4.7	3.400	3.400	0.0
Infusorial earth	3.420	2.430	−29.0	3.400	3.505	+3.0
Fullers' earth.....	3.420	2.964	−13.4	3.400	3.350	−1.5

Two things are clear in these results. First, that excessive amounts of any filtering medium mean a loss in strength of the solution, and this loss is the greater the nearer the solution is to its saturation point. Weak solutions may show little or even no loss, while strong solutions show a considerable loss.

Second, fullers' earth is decidedly absorptive to alkaloidal solutions, but less so to neutral bodies. It will be noticed that the strychnine and atropine were entirely removed from solution by this agent, while other alkaloidal solutions lost a quarter to nearly half their strength.

These figures would doubtless vary with the proportion of earth employed, but even in small portions it will cause a loss.

The other three agents, paper pulp, purified talc, and infusorial earth, probably do not differ very much in their absorptive power, but they differ in their adaptability.

Paper pulp was found to filter quite readily, if not packed too firmly. It occasions little loss, but is not so efficient a clarifying agent as the powders.

In comparing talc with infusorial earth there is first to be noted that, while equal weights (5 Gm.) of these agents were used in the experiments, the infusorial earth is so much lighter than talc that more than twice as much, in bulk, of the earth was used and consequently the absorption appears greater.

Filtration was also much slower through the infusorial earth, and in the case of the alcoholic solutions the loss by evaporation from the filter more than counterbalances the loss by absorption, and the filtrates frequently show a gain in strength. Even when equal bulks of these two agents are used, infusorial earth is less than a quarter as rapid in action as talc, and, except for work in a filter press, is much less desirable as a clarifying medium.

Another factor to be observed in considering infusorial earth is that much of it contains carbonates, and even when these are not soluble in neutral liquids they may react with substances in solution.

In an experiment made in the early part of this investigation in which 1 percent solutions of strychnine (as sulphate) lost 49.1 percent, 42.6 percent, and 36.1 percent of their strength, respectively, the losses were found to be due to the presence of carbonate in the earth, though the carbonate was not sufficiently soluble in distilled water to produce an alkaline reaction.

For general use purified talc is the most satisfactory clarifying medium for pharmaceutical purposes, but care should be taken to avoid loss both of the solution and of strength, by excess. The smallest quantity that will do the work should be employed, both for economic reasons and for standard results.

Another point suggested by these experiments is that in making preparations which need to be clarified it is safer to adjust the final volume before clarifying than to make up to the full yield by passing enough menstruum through the filter to obtain it. Since the material absorbed in the filter is richer in dissolved or absorbed substances than the filtrate, washing with a relatively small amount of menstruum is not likely to displace it entirely, and the product is so much the weaker. The loss of a small portion of the product is better than the weakening of the whole.

LABORATORY OF PARKE, DAVIS & CO., Detroit, Mich.

PERFUMES.*

BASIC MATERIALS, PRODUCTION, PRESERVATION AND SELLING POINTS.

BY WILLIAM A. HALL.

In considering this subject, I am impelled chiefly to throw what light I can for an educative effect, and from that, by deduction and the experience such statements as may, if followed, result in a better understanding of this article of commerce, the limitations and means to be taken for our financial benefit.

From the earliest written records the item of *perfumes* has ever played an important part and always has it seemed to be not merely a luxury but a necessity. Writers have vied with each other in describing the art of perfume manufacturing, and many uses to which the products were put. From sage to savage, from ruler to the humblest citizen, has come the demand for this invisible scent or perfume, and to furnish it have collectors, chemists, steam and sail, perfumer and dealer been requisitioned.

The crude methods of the ancients have yielded to the refined processes of the present, but the facts are as true to-day as of yore, and emphasis should be laid here that the floral odors, as produced by Nature and conserved by man, cannot be successfully supplanted by the synthetical coal-tar products of the present, so freely exploited.

Rankness, as against fragrance, variation *vs.* stability, greater present profit *vs.* permanent future business, you may have, but who wishes to exchange the promise for the reality, when it comes to our commercial efforts?

If one rose is fair and sweet, as is universally acknowledged, think of nineteen hundred sixty tones of roses, the product of one season, in the Valley of Var in the south of France; think of one hundred tons of roses a day, often gathered at Grasse, the rose centre of that region.

At Grasse, they use three thousand pounds of rose leaves to make a pound of attar or *otto of roses,* the well-known oil distilled from the fragrant petals, and

* Read before the Section on Commercial Interests, A. Ph. A., San Francisco meeting.

into every ounce of the rich essence is concentrated the odor of 400,000 roses, so that to make the whole pound it would take nearly half a million roses. The pound of French attar sells for as much as three hundred dollars; at retail, by the ounce or drop, the quantity in which it is more frequently sold, it would bring a great many times as much as that sum.

Many flowers are made into the perfumes of commerce, but the rose has ever been the queen of the perfume market of the world, as she is of every garden. From the earliest times, the fragrance of the roses of the Persian summers has been distilled for the delight of the whole year round. Later on, they began to cultivate roses in Turkey for the same purpose, and so in India, till down to the present time, when, though these older countries still furnish some share of the entire output, the greater part of the flower perfume supply comes from the fields of Bulgaria and France, the quality of France's product being recognized at the present time as superior to that of any other country in the world.

If the Valley of Damascus and the Vale of Cashmere deserve the fame that the poets have given them for their production of sweet scents, certainly Grasse is the spot to which the modern writer, to whom the sentiment of fragrant odor appeals, should go for inspiration. Grasse is the principal centre of the raw perfume trade of Europe, and through its steep and narrow streets have been carried every year, for centuries, the tons of rich substance heavily charged with the concentrated essences extracted in its factories from the blossoms gathered in the fields. It is said that the famous Catherine de Medici was the one who first discerned the possibilities of Grasse as a perfume centre, and that she gave the order for roses to be planted there for commercial purposes, and for the establishment of perfume factories in the place.

Though the output of roses is one of the greatest flower products of the place, there are many other flowers grown for market in the fields of Grasse. Among the crops next in importance are those of the violet, jasmine and neroli, which is the oil of the bitter orange flower. The crops are produced in regular succession by the flower farmers, just as ordinary peas and potatoes would be brought forward, each vegetable in its season, and the flowers are gathered and marketed with the same system that the truck farmer employs to dispose of what he has produced.

The fragrant harvest of this neighborhood, beginning in January with the violet and lasting late in the fall, gives employment to a great number of persons, mostly women and girls.

The rose that is grown at Grasse for the manufacture of perfume is a pink rose known in the neighborhood as "Rose de Mai." This is botanically the *R. Centifolia,* no doubt the same as the old-fashioned "Hundred-leaved Rose" of our gardens. The rose that is used in Bulgaria is the famous red Damask Rose, which originated in Persia, and was also very familiar to our gardens in days of the past, if it is not to be found there at the present time.

The Grasse farmer sets his bushes out in rows, not too close to each other, on ground gently sloping to the southeast, if possible. The young shoots are taken from a five-year-old bush, and are planted in the ground, which has been well broken up to a depth of three or four feet. When the plants begin to branch out, the tops are cut off about a foot from the ground. The buds that come out the first year are picked off so that none of the vitality of the plant may be spent in blossoming at that time.

By the fourth or fifth year, the rose bushes in the fields are in full yielding condition. A rosebush, though it lives to a good age, does not yield much after its seventh year; at that period the Grasse farmer digs up his bushes and burns

them. The land is then planted with some other crop for the space of a year, and then set out with roses again.

The rose harvest begins about the middle of April and lasts through May to early June. The time is so short and the blossoms come in such profusion that, even with the immense number of harvesters employed, great difficulty is experienced in dealing with the crop, especially as the orange flower harvest comes in at the same time. The roses must be carried to the factory at once and immediately used, or great loss of perfume occurs. The buds, on the point of opening, are picked in the early morning and dropped into baskets, each holding two bushels of flowers, which are carried on the arms of the pickers. The picking goes on until about ten or eleven o'clock, or all day if the weather happens to be cloudy. When the sun is hottest, no flowers are gathered, but toward four or five o'clock in the afternoon they begin again, and keep on until dark.

At the factory, the petals are first completely separated from the green parts and the pistil of the flower, the pink petals with the central yellow stamens being all that will produce any perfume.

Heaps of as much as four tons of these will sometimes be piled upon the floor of the factory at one time. The petals, after they are separated from the rest of the flower, are then either distilled with water for the production of attar and rosewater, or they are subjected to the process of maceration in warm fat or olive oil, for the purpose of obtaining the perfumed pomade or scented oil from which the bottled perfume is finally made.

This pomade gives the true scent of the blossoms. With attar of roses and rosewater the most delicate odor of the petals is destroyed by contact with boiling water, but with the pomade the grease absorbs the fragrance perfectly and it is afterward taken up by the solvent that is used to extract it. Formerly the olive oil was used for absorbing the scent directly from the blossoms, but now fat or ceresene is the macerating agent. The best fat for the purpose is beef suet mixed with lard of corn-fed pigs.

Some flowers, like the tuberose and jasmine, being especially delicate, have their odor destroyed altogether by contact with even a low degree of heat, so the scent of these is obtained by a cold process, a layer of flowers being placed upon one of refined lard, so that the odor may be extracted gradually by the cold grease.

The success of the pomade from which the perfume is made depends upon the absolute purity of the fat that is used. To bring it to a suitable condition, it is "pan-rendered" by dry steam and afterward washed and washed with various substances and manipulated according to the judgment and experience of the manufacturer until the grease has lost all trace of its animal origin and seems as pure and sweet as the roses themselves.

To make the rose pomade, one hundred-weight of the prepared fat is placed in a tinned copper vessel capable of holding five hundred-weight and melted by means of a water-bath or steam jacket. About one hundred-weight of the flower petals are added and stirred in with a wooden spatula. They are left for a day, being stirred occasionally, and then strained off. More roses are then put in the same pomade, stirred and left in the same way, and so on, until the grease is fully impregnated with the odor of the flowers.

When the pomade is fully scented, the clean upper part, free from impurities, is poured off into the canisters, and then is ready for sale or for immediate use in making the extract. This is done by heating up the purified pomade with refined cologne spirits. The spirits and pomade, kept constantly stirred by a special apparatus, are left together for from three days to a week, until the liquid has

taken up all the scent previously absorbed by the fat from the flowers. The fat and liquid are then separated, the one being of no further use now, except for soap making, while the other is just ready to begin an important career. The perfumer does not take the rose extract as it is obtained from the pomade to make rose perfume, nor violet, nor jasmine, nor any other flower that blows. He combines these extracts with each other and with certain animal perfumes, like musk or ambergris, or with fragrant resins, gums and spices known to those of his craft. One scent is made predominant and characteristic of the mixture; the rest give it body and permanence.

It is a fragrant experience to go, at any time, into a perfume factory, and there are large establishments of this kind to be found in the United States.

The quality of the products of our first-class perfumers is gradually convincing the public of the value of the best American perfumes, though people were slow to believe that anything as fine as the imported extracts could be produced at home. There are certainly perfumes produced in this country which rival, if they do not surpass, the products of the foreign manufacturers, but it is doubtful if the flowers used in making them can ever be grown in the United States. There is no country like the south of France for bringing to perfection the scented blossoms that are desirable for making the best perfumes, so that the American perfumer still imports his pomade from the south of France, and confines his skill to perfecting the combinations that will produce the most fragrant, refreshing and lasting results; and in this he starts even with the Parisian perfumer himself.

Musk is one of the animal perfumes most commonly used to give permanence to the more volatile scents of flowers. A small portion of musk mixed with violet or rose extracts, in connection with such other ingredients as the perfumer's art suggests, attains this object without detracting from the delicacy of the desired odor. While musk is used to a limited extent, as such, by a few, and in some cases by a connoisseur, seldom do persons of good taste use it these days, except unconsciously in the inoffensive quantities that are combined with the special odors of rose, violet, heliotrope, and other flowers which form the basis of a preferred perfume.

Musk is the product of the musk deer, which is found in China and Thibet, and is worth from $20 to $40 an ounce. Another expensive animal product which adds its sweet scent to flower combinations is ambergris, which is a formation taken from diseased sperm whales, while civet, also used in perfume-making, is obtained from an animal of the cat family, found in Abyssinia and the Soudan. These are not all, but the chief animal products used in perfumes.

Having wisely selected a good line of natural odors and placed them in stock, protect them as well as possible from heat and light and from the accumulation of dust and dirt. Frequently clean thoroughly the stoppers and necks of your open bulk extracts. It is desirable to have an enclosed wall case, protected from too strong a light, where all opened bulk extracts can be kept; and not too large a line carried—ten or twelve of the best odors of a first-class maker are sufficient to feature, with, perhaps, the specialities of other makers, providing the demand is created by personal call and not by free goods or special inducements. This case should be large enough so that in the bottom of same can be kept small bottles, 1½ drachms, ½ oz., 1 oz. and 2 oz. capacity, cleaned, corked and labelled in blank, but not filled until the sale, when you can fill directly from the bulk bottle, thus avoiding the use of the graduate commonly taken for all perfumes, and write in the name on the label. Never pour the dregs of an old bottle into a freshly opened one, and you avoid a common cause of deterioration of bulk extracts.

SELLING POINTS.

The demonstrators in large stores have their uses in many lines of goods and with a complete toilet line are more or less successful, but I believe the friend-to-friend advertising of good goods, when it comes to perfumes, is really more effective. The enormous number of petty grafters in the body politic for "samples" without purchase detracts from the demonstrator's success. Instead of the shotgun, why not use the rifle? Get up *yourself* a letter, carefully choosing your language, saying just what you wish and *no more* and send to your select trade on excellent stationery, well printed, under 2 cents postage.

The successful seller of perfumes should have a good *general* knowledge and all the *special* knowledge he can acquire. The tactful salesman shows the perfumes in the most convincing manner, as judgment dictates.

In showing the goods to a customer, find out, if possible, what the customer wants. If a rose, show him a rose, either from the point of the stopper with the spirit evaporated, a bit of clean absorbent cotton, or thin rice paper. Clean cigarette papers are good. Never show the perfume by placing on the hand, especially if you wish to show another odor. If the customer has no choice, then it is up to you to show him, by a similar method, some perfume that he knows has been successful. One must also have enthusiasm to sell perfumes, and the better the goods, the more lasting the result. Having made the sale, deliver the goods in as neat a package as you can, to convey all along the line all the artistic effect possible.

My experience of over thirty years tells me the synthetic odors, or a poor line, do not begin to have the power as a tradeholder that the natural floral odors do; also the latter excels as a business getter and business builder. "You cannot make a silk purse out of a sow's ear." There are reasons for this, too. The synthetic, in a relatively short time, undergoes a change, even to the breaking-up point, while the natural, especially if kept under proper conditions, holds for a long time, with but little change, in the bulk goods. A familiar example is solution of vanillin and tincture of vanilla. The former goes back, while the latter improves with age.

Featuring the product of one first-class line, as indicated in this paper, caused me to buy of that line the past three years: 1912, $295; 1913, $411; 1914, $315. I am indebted to one perfume manufacturer for some of the information given, but who requested his name should not be mentioned.

TECHNICAL DRUG STUDIES: II. ON THE STABILITY OF SPIRIT OF NITROUS ETHER.*

BY L. F. KEBLER, S. PALKIN, AND C. O. EWING.

The stability of spirit of nitrous ether under various conditions of preparation and storage has been studied by a number of investigators.[1] It has been generally found that by observing certain very ordinary precautions, it is possible to keep this product for a considerable length of time without material change and that its alleged unstability has been exaggerated. Yet notwithstanding the general conclusions arrived at and published in various pharmaceutical and chemical journals, an examination of a large number of samples collected from retailers and manufacturers has disclosed a great many which varied from the legal standard. It was, therefore, deemed advisable to make an investigation of the keeping qualities of this product under conditions obtaining in most drug stores, as well as under modified conditions suggested by previous investigators.

The series of experiments was formulated to test out the following points:

1. Does the water and other foreign material commonly present in U. S. P. alcohol materially hasten the decomposition of the spirit of nitrous ether?
2. Does the use of absolute alcohol increase its stability?
3. Is refrigeration necessary?
4. Does potassium bicarbonate by neutralizing the acidity retard decomposition?
5. Are small (individual) containers preferable to large stock bottles?
6. Does frequent opening of large stock containers and a large air space above the spirit hasten deterioration?
7. What time limit ought to be set on the keeping of this product?

Twelve sets of samples of two general types were prepared: (*a*) seven made up with U. S. P. alcohol (95.5 percent) and (*b*) five made up with U. S. P. absolute alcohol. In view of the fact that a very large percent of the spirit of nitrous ether is made by diluting concentrated ethyl nitrite (90 percent), this was used as a basis for the experiments. The entire quantity for each type of experiment was prepared in a large container by diluting the concentrated ethyl nitrite in the one case with U. S. P. alcohol and in the other with absolute alcohol U. S. P. These were then assayed by the U. S. P. method and bottled. In order to avoid loss by evaporation when distributing the product into the various containers, a syphon with a ground-glass stop-cock was prepared and each container then filled from the large container by means of this syphon.

The following sets of experiments were prepared from the U. S. P (95.5 percent) alcohol (Type *A*):

No. 1. Ten 30 mil, amber-colored bottles, kept on a shelf in the laboratory, exposed to diffused light.

No. 2. Ten 30 mil, amber-colored bottles, containing a small quantity of potassium bicarbonate, kept on a shelf, exposed to diffused light.

---

* Presented January 26, 1916, at the City of Washington Branch of the American Pharmaceutical Association.

[1] J. E. Stacy, Proc. Mass. Pharm. Assoc. (1899), 53. Farr and Wright, Trans. Brit. Pharm. Conf. (1901), 447. D. Gilmore, Pharm. Jour., 66, 54 (1901). B. O. Leubner, Merck's Report, 11, 344 (1902). G. E. Shaw, Pharm. Jour., 71, 236 (1903). L. A. Brown, Amer. Drug., 59, 215 (1911). J. R. Rippetoe, Amer. Drug., 59, 307 (1911). C. B. Jordan, Proc. Ind. Pharm. Assoc. (1912), 53. F. L. Shannon, Jour. Amer. Pharm. Assoc., 2, 83 (1913).

No. 3. Ten 30 mil, flint bottles kept in diffused light.
No. 4. Ten 30 mil, flint bottles kept in a refrigerator.

No. 5. One 360 mil, amber-colored bottle, exposed to diffused light.
No. 6. One 360 mil, amber-colored bottle containing some potassium bicarbonate, kept in diffused light.
No. 7. One 360 mil, flint bottle kept in a refrigerator.

The following sets were prepared from the absolute alcohol, U. S. P. (Type *B*):

No. 8. Ten 30 mil, flint bottles kept in a refrigerator.
No. 9. Ten 30 mil, flint bottles kept in diffused light.
No. 10. One 30 mil, amber-colored bottle kept in diffused light.

No. 11. One 360 mil, flint bottle kept in a refrigerator.
No. 12. Ten 360 mil, amber-colored bottles exposed to diffused light.

As no hydrolytic action was expected in the sets of Type *B*, it was not thought necessary to try any experiments using $KHCO_3$ to counteract any acid formed.

All bottles were stoppered with paraffined corks. The temperature of the refrigerator in which Nos. 4, 7, 8, and 11 were stored ranged from about 8° to 15° C., and that of the room in which the other samples were kept from about 20° to 32° C.

The assay before bottling showed *A* to contain 4.56 percent of ethyl nitrite and *B*, 4.68 percent. Inasmuch as the purpose of the experiments was to study the deterioration of the product, it was not thought necessary to dilute it to 4 percent, the minimum U. S. P. strength. In fact, the test would seem to be all the more rigid when using a product of higher strength.

The following table shows the results of the assays of the various samples, made from time to time. In all cases the U. S. P. method was used.

INFLUENCE OF STORAGE ON SPIRIT OF NITROUS ETHER.

	A (U. S. P. 95.5 percent Alcohol).							*B* (U. S. P. Absolute Alcohol).				
	1	2	3	4	5	6	7	8	9	10	11	12
Type of container	Small amber	Small amber	Small white	Small white	Large amber	Large amber	Large white	Small white	Small white	Large amber	Large white	Small amber
Condition of storage	Light	Light $KHCO_3$	Light	Refrig.	Light	Light $KHCO_3$	Refrig.	Refrig.	Light	Light	Refrig.	Light
1914												
May 27	4.56	4.56	4.56	4.56	4.56	4.56	4.56	4.68	4.68	4.68	4.68	4.68
June 30	4.52	4.51	4.57	4.53	4.58	4.60	4.58	4.69	4.64	4.71	4.65	4.74
July 30	4.39	4.10*	4.27	4.51	4.59	4.51	4.39	4.55	4.64	4.67	4.76	4.50
Aug. 31	4.41	4.62	4.34	4.35	4.31	4.59	4.42	4.51	4.47	4.6	4.68	4.57
Nov. 28	4.46	4.57	4.19	4.43	3.08*	4.39	4.32	4.50	4.31	4.61	4.71	4.46
1915												
July 22	4.15	4.48	3.79	4.35	0.26*	3.97	4.35	4.58	3.10	4.62	4.60	4.48
Aug. 22	3.67	4.28	3.58	4.38	0.23*	4.01	4.06	4.59	3.77	4.21	4.61	4.46
Sept. 28	3.06	4.22	3.54	4.4	0.25*	3.19	3.98	4.56	3.64	4.17	4.51	2.93
Nov. 2	3.07	4.20	3.50	4.54	**	**	3.82	4.60	4.10	3.76	4.59	4.65
Nov. 28	**	**	3.83	4.53	**	**	3.96	4.56	3.84	**	4.60	4.14

* Cork loose.
** Material exhausted.

The results can perhaps best be appreciated by considering the different intervals of time that elapsed during the experiment. For the first three months it might be said that all samples kept well whether U. S. P. (95.5 percent) or

absolute alcohol was used; whether kept in diffused light at ordinary temperature or in a refrigerator; with or without potassium bicarbonate; in small filled (individual) bottles or in large bottles. The material in the large amber bottle kept in diffused light showed the greatest loss, but this was only 0.25 percent of ethyl nitrite. In this case it was found that the cork did not fit tightly, and still later in the experiments it was found to be quite loose.

When kept for six months, it might be said that all, with the exception of No. 5 (which had the cork loose) and Nos. 3 and 9 kept very well. The greatest deterioration (in Nos. 3 and 9) was 0.37 percent, or about 8 percent of the original ethyl nitrite.

When kept for somewhat over a year (fourteen months in these experiments), under conditions observed in Nos. 2, 4, and 7 of Type *A* and Nos. 8, 10, 11, and 12 of Type *B*, the results showed that the losses came within a reasonable variation. Both small and large amber bottles of Type *B* stored under ordinary conditions of temperature and light kept well. This was also true of the small amber containers of Type *A* with potassium bicarbonate. However, it is not believed to be desirable to keep the product a year before dispensing.

When kept for a period of over eighteen months, of Type *A* only those stored in small bottles and kept in a refrigerator remained practically unchanged; of Type *B*, both small and large bottles kept in the refrigerator were not subject to any material change, and there seems to be no doubt that the product kept under those conditions would have stood much longer without change. Lack of material prevented the continuation of the experiments to verify this belief.

Quite in accord with the results obtained by earlier experimenters, these observations show that *properly prepared* spirit of nitrous ether is comparatively stable and can be kept without material change much longer than the average pharmacy would ordinarily keep it.

The conclusion might therefore be reached from these experiments, that for all ordinary purposes the U. S. P. spirit of nitrous ether does not offer any great difficulties in order to be kept up to the standard strength, provided it is made up to the proper strength to begin with, carefully bottled and stoppered with paraffined corks. If the spirit is prepared with 95 percent alcohol, it is best to store it in a refrigerator or in small amber containers kept in diffused light. If stored in large amber bottles kept in diffused light, it is best to use absolute alcohol in its preparation.

Concentrated Spirit of Nitrous Ether.—Since spirit of nitrous ether is usually made by diluting concentrated (90 percent) ethyl nitrite with alcohol, it is interesting to note the ethyl nitrite content of four samples, after being stored in a refrigerator for three years. Each sample was obtained from a different manufacturer and was stated to contain 90 percent ethyl nitrite. Samples I, II, and III kept well and presented no difficulty in opening. When diluted and assayed by the U. S. P. method, they yielded 89.6 percent, 92.0 percent, and 93.4 percent, respectively. Sample IV, however, although sealed in amber glass tubes, had partially decomposed. Of the four tubes at hand, three exploded violently when an attempt was made to open them, although they had been cooled in an ice-salt freezing mixture. A strong odor of nitrous acid was also given off. The third tube was less decomposed, although the pressure was such, even after cooling, that some of the contents were expelled. The assay showed only 81.0 percent of ethyl nitrite. The data so far obtained are insufficient to draw any conclusions as to the keeping quality of the concentrated spirit.

COLORIMETRIC ESTIMATION OF IRON IN PHARMACEUTICAL PREPARATIONS.*

BY JOSEPH L. MAYER.

The National Formulary, in addition to giving a formula for beef, iron and wine, solution of iron peptonate, solution iron albuminate, etc., has a note appended to the process stating the approximate quantity of iron contained in the finished product. In view of the fact that the National Formulary is a legal standard, it is necessary to analyze this class of preparations to ascertain whether they are of the proper strength, and as there is no method of assay official, I have for a considerable time employed the following colorimetric method with excellent results:

Ten Cc. beef, iron and wine are diluted with distilled water to 500 Cc.; 5 Cc. of this solution are evaporated and ignited in a platinum dish, 5 Cc. HCl (1–1) added, the material boiled an instant, poured into a 100 Cc. Nessler tube, water added q. s. 100 Cc., 3 drops of $KMnO_4$ solution (5–1000) added to oxidize the iron, and after a few minutes 10 Cc. of KSCN solution (20–1000) added, the color produced being immediately compared with the iron standards.

The iron standards are made up according to the method of D. D. Jackson, by mixing definite quantities of two solutions, one containing potassium platinic chloride and the other cobaltous chloride (Tech. Quar., vol. xiii, No. 4, Dec., 1900, p. 320). Mr. Jackson suggested these for the analysis of water, for which purpose I have employed them for a number of years. The first edition of the "Standard Methods for the Examination of Water and Sewage" of the American Public Health Association contained them, but for some reason, unknown to me, the present second edition of that work has omitted the method. The standards are prepared so that when 100 Cc. of water are taken for analysis, the reading on the tubes indicates at once parts per million (mg. per L.). To determine the accuracy of the method, the following experiments were conducted, the sample employed being beef, iron and wine, the results recorded being the mean of several analyses, all of which yielded extremely close checks:

(*A*) Ten Cc. beef, iron and wine were diluted to 500 Cc., and 5 Cc. of this dilution were evaporated, ignited and treated as above in the colorimetric method. The material matched standard tube 1.75; then since 5 Cc. = tube $1.75 \times 100 =$ the entire 500 Cc. dilution = 175. As the 500 Cc. contained 10 Cc. beef, iron and wine, this, multiplied by 10, equals 1750 for 100 Cc. beef, iron and wine. As the standards are so constructed that the reading gives immediately parts per million when 100 Cc. water is taken for analysis, then 100 Cc. beef, iron and wine would equal 1750 parts per million, or 1750 mg. per 1000 Cc. beef, iron and wine, or 175.0 mg. per 100 Cc. beef, iron and wine. Or, what is simpler, multiply the reading on the standard tube by 100, and when the above quantities of sample are employed, the result will be milligrammes of iron per 100 Cc. of sample. The sample indicated the presence of 0.175 Gm. iron per 100 Cc.

(*B*) Ten Cc. beef, iron and wine were taken, evaporated in a platinum dish on a water-bath, ignited by placing one Bunsen burner under the dish and playing another Bunsen flame, held in the hand, on top of the residue, thus easily ashing the material without any loss through foaming, etc. The dish containing the ash was then placed on the water-bath, 10 Cc. strong hydrochloric acid and 15 Cc. water added, and heated until completely dissolved. This was then filtered through a 9 cm., ashless filter paper into a 400 Cc. nonsol beaker, and the filter washed

* Read before the Kings County Pharmaceutical Society, April 11, 1916.

until free from iron, the solution in the beaker then oxidized by boiling with HNO_3, precipitated with filtered NH_4OH, filtered through a Gooch crucible, washed, dried, ignited and weighed as Fe_2O_3. The weight of $Fe_2O_3 \times .70 \times 10 =$ weight of iron as metallic iron per 100 Cc. The analysis indicated the presence of 0.2765 Gm. iron per 100 Cc. The difference between these figures and those obtained by the colorimetric method being so great, another gravimetric determination was made as follows:

(*C*) Ten Cc. beef, iron and wine were treated as under (*B*), the thoroughly washed precipitate of $Fe_2(OH)_6$ dissolved in hot HCl, the paper thoroughly washed, and the iron again precipitated from the solution, and the analysis completed as under (*B*).

The analysis indicated the presence of 0.2743 Gm. of iron per 100 Cc.

Another determination was made as follows:

(*D*) Ten Cc. beef, iron and wine were diluted with about 100 Cc. distilled water, ammonium chloride, and an excess of NH_4OH added and H_2S passed to saturation. About 10 Cc. ether were added, the material thoroughly stirred while heating on a water-bath, and filtered through a 9 cm. filter (the addition of ether and thorough stirring make the precipitate settle quickly and cause a very rapid filtration), washed thoroughly. The precipitate was then dissolved in HCl, catching the solution in a 400 Cc. nonsol beaker, the paper washed thoroughly and the solution boiled to get rid of H_2S, after which it was oxidized with HNO_3, the iron precipitated and the analysis conducted as under (*B*). The analysis indicated the presence of 0.175 Gm. iron per 100 Cc. of solution.

Another analysis was then made as follows:

(*E*) Ten Cc. beef, iron and wine were ignited and dissolved as under (*B*). This solution was then poured into a porcelain evaporating dish, HNO_3 added to oxidize, boiled and evaporated to dryness on a water-bath. Water was added and the material was again evaporated to dryness. This treatment was repeated until all HNO_3 was expelled, after which the residue was dissolved in HCl, transferred to a 100 Cc. glass-stoppered flask and the assay completed by the U.S.P. Iodometric Method. The analysis indicated the presence of 0.1787 Gm. iron per 100 Cc.

Another analysis was made as follows:

(*F*) Ten Cc. beef, iron and wine were ignited as under (*B*), and the ash carefully moistened with a few drops of HNO_3, evaporated, ignited, and the material dissolved by heating with diluted HCl (10–15), and the determination finished by the U.S.P. Iodometric Method. The analysis indicated the presence of 0.1789 Gm. iron per 100 Cc.

Another determination was made as follows:

(*G*) Ten Cc. beef, iron and wine were ignited and dissolved in HCl as under (*B*). This solution transferred to a 250 Cc. Erlenmeyer flask almost filled with distilled water, heated to almost boiling, H_2S gas passed to saturation, boiled on a gauze (gently at first to avoid loss) until the solution was reduced to about one-half its volume, cooled and titrated with N/10 $KMnO_4$ V.S. until the appearance of a permanent pink tint (Conn. Agr. Exp. Sta., 1907–08, page 685). The analysis indicated the presence of 0.1839 Gm. of iron per 100 Cc.

Another determination was made as follows:

(*H*) Ten Cc. of beef, iron and wine were ignited and dissolved in HCl as under (*B*), the solution reduced with stannous chloride and titrated with N/10 $K_2Cr_2O_7$ as directed in the methods of the U. S. Steel Corporation for the analysis of iron ores (*Journ. Ind. Eng. Chem.*, Feb., 1909, page 107). The analysis indicated the presence of 0.1831 Gm. of iron per 100 Cc. Another determination was made as follows:

(*I*) Ten Cc. beef, iron and wine were ignited and dissolved as under (*B*),

the solution reduced with stannous chloride and titrated with N/10 $KMnO_4$, as directed in the methods of the U. S. Steel Corporation for the analysis of iron ores (Journ. Ind. Eng. Chem., Feb., 1909, page 107). The analysis indicated the presence of 0.1776 Gm. iron per 100 Cc.

Another determination was made as follows:

(*J*) Ten Cc. beef, iron and wine were ignited and dissolved as under (*B*), the solution transferred to a 250 Cc. Erlenmeyer flask fitted with a rubber stopper and Bunsen valve, a few crystals of $KClO_3$ added, placed on the hot plate, boiled gently a few minutes, about 2 Gm. of iron-free zinc added (.002 percent Fe), a little sodium carbonate added to expel the air, heated nearly to boiling until the color of the solution was green and entirely free from the slightest tint of yellow. The stopper was then removed and a mixture of 10 Cc. H_2SO_4 and 20 Cc. H_2O added, and, after adding a small amount of sodium carbonate to expel the air, the stopper was replaced and the solution again heated until no undissolved particles of zinc remained. After allowing the solution to cool, it was diluted with cold, recently-boiled, distilled water and titrated with N/10 $KMnO_4$ until the appearance of a pink tint. The analysis indicated the presence of 0.1776 Gm. iron per 100 Cc.

The results by all methods were as follows:

A. 0.175 Gm. iron per 100 Cc. beef, iron and wine.
B. 0.2765 Gm. iron per 100 Cc. beef, iron and wine.
C. 0.2743 Gm. iron per 100 Cc. beef, iron and wine.
D. 0.1750 Gm. iron per 100 Cc. beef, iron and wine.
E. 0.1787 Gm. iron per 100 Cc. beef, iron and wine.
F. 0.1789 Gm. iron per 100 Cc. beef, iron and wine.
G. 0.1839 Gm. iron per 100 Cc. beef, iron and wine.
H. 0.1831 Gm. iron per 100 Cc. beef, iron and wine.
I. 0.1776 Gm. iron per 100 Cc. beef, iron and wine.
J. 0.1776 Gm. iron per 100 Cc. beef, iron and wine.

A glance at the above table will show that all methods excepting (*B*) and (*C*)—both practically identical—yielded the same results, the mean (excluding (*B*) and (*C*)) being 0.1787.

I am at a loss to account for the high results under (*B*) and (*C*), for, if it is assumed that the wine employed in making the beef, iron and wine contained aluminum, or that the precipitate was contaminated with silica dissolved by the alkali from the glass, this same condition should hold for (*D*), where the iron was precipitated with NH_4OH and H_2S, dissolved and reprecipitated with NH_4OH, which, of course, would precipitate aluminum and silica. The precipitations were made in nonsol beakers, the solutions being filtered very rapidly to avoid contamination with the silica of the glass.

The fact that the results by method (*D*) closely check the colorimetric and volumetric methods makes it difficult to explain these high results.

It is clearly proven by these results that the determination of iron in this class of preparations by precipitation, as hydroxide, ignition and weighing, as oxide, is apt to lead to high results and is therefore not a suitable method.

In laboratories equipped with the iron standards, the colorimetric method for the quantitative estimation of iron is extremely accurate, easy to apply and rapid. Should, however, another method be desired, any of the volumetric methods embodied in this paper will give accurate results.

RESEARCH AND ANALYTICAL DEPARTMENT,
RIKER LABORATORIES.

PHARMACOPŒIAL BOTANIC DRUGS OF THE TWENTIETH CENTURY.*

By E. N. Gathercoal.

Latin plant names	English names	Austrian	Belgian	British	Croatian	Danish	French	German	Hungarian	Italian	Japanese	Mexican	Netherlands	Norwegian	Russian	Servian	Spanish	Swedish	Swiss	U. S. P. VIII	U. S. P. IX
(9) Pinus montana																					
(10) Pinus Australis																					
(11) Pinus maritima																					
(12) Abies Sibirica																					
389. Piper angustifolium, lv	Matico											X								X	
390. Piper Betle, lv	Betel			X																	
391. Piper Cubeba, unr. ft	Cubeb	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
392. Piper Cubeba, v. o	Oil of Cubeb			X																X	X
393. Piper officinarum, ft	Long Pepper						X														
394. Piper methysticum, rh	Kava-Kava			X																	
395. Piper nigrum	Black Pepper	X	X								X	X								X	X
396. Pistacia Lentiscus, res	Mastic	X	X		X							X		X		X	X	X		X	
397. Pistacia terebinthus, balsamic, res	Chios Turpentine																				
398. Plantago major, lv	Plantain											X					X				
399. Plantago ovata, s				X																	
400. Plantago psyllium, s	Fleaseed											X					X				
401. Podophyllum Emodi, rh. & rt	Indian Podophyllum			X																	
402. Podophyllum peltatum, rh. & rt	Mandrake		X	X			X			X		X	X				X			X	X
403. Polygala amara, plant	Bitter Polygala					X															
404. Polygala Senega, root	Senega	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
405. Polygonum aviculare, fl. herb	Knotgrass	X																			
406. Polygonum Bistorta, rh	Bistort		X				X														
407. Polyporpus fomentarius, fungus	Surgeon's Agaric	X					X					X									
408. Polyporpus officinalis, fungus	White Agaric	X					X			X		X					X		X		
409. Populus nigra, buds	Black Poplar						X										X				
410. Potentilla Tormentilla, rh	Tormentilla						X												X		
411. Prunus Amygdalus, var. amara, s	Bitter Almond	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	
412. Prunus Amygdalus, v. o	Oil of Bit. Almond						X					X		X			X			X	X
413. Prunus Amygdalus, var. dulcis, s	Sweet Almond	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
414. Prunus Amygdalus, both varieties, fo	Sweet Almond Oil		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
415. Prunus armeniaca, s	Apricot Seed										X										
416. Prunus domestica, ft	Prunes												X							X	
417. Prunus Laurocerasus, lv	Cherry Laurel		X	X			X			X			X				X				
418. Prunus Laurocerasus, v. o	Oil of Cherry Laurel												X								
419. Prunus macrophylla, lv											X										
420. Prunus serotina, bk	Wild Cherry Bark			X								X								X	X
421. Psidium Guaiava, lv													X								
422. Pterocarpus Morsupium, ext. wd	Kino			X							X								X	X	X
423. Pterocarpus santalinus, ht.wd	Red Saunders	X		X							X		X				X	X		X	X
424. Pueraria Thunbergiana, rt. stch	Kuzu Starch										X										

*Continued from p. 421, April issue.

*Continued from p. 421, April issue.

| | | |

Latin plant names	English names	Austrian	Belgian	British	Croatian	Danish	French	German	Hungarian	Italian	Japanese	Mexican	Netherlands	Norwegian	Russian	Servian	Spanish	Swedish	Swiss	U.S.P. VIII	U.S.P. IX
454. Ruta graveolens, lv. or hb	Rue						X					X					X		X		
455. Ruta graveolens, v. o. hb	Oil of Rue		X																		
456. Saccharomyces Kefir, fungus	Kefir														X						
457. Salvia officinalis, lv	Sage	X			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
458. Sambucus nigra, fl	Elder Flowers	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X		
459. Sambucus nigra, ft	Elder Berries									X			X								
460. Sambucus nigra, ft. j	Elder Berry Juice	X			X				X				X				X		X		
461. Sanguinaria Canadensis, rh	Bloodroot																			X	X
462. Santalum album, ht. wd	Sandalwood						X										X				
463. Santalum album, v. o	Sandalwood Oil	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X
464. Saponaria officinalis, rt	Soapwort						X					X									
465. Sassafras officinale, pith	Sassafras Pith																			X	
466. Sassafras officinale, rt	Sassafras Root										X										
467. Sassafras officinale, rt. bk	Sassafras Bark											X							X	X	X
468. Sassafras officinale, rt. wd	Sassafras Wood	X						X					X				X				
469. Sassafras officinale, v. o	Oil of Sassafras											X					X			X	X
470. Satureja hortensis, hb							X														
471. Schleichera trijuga, f. o. s	Koesambi Oil												X								
472. Scolopendrium officinale, hb													X								
473. Scopola Carniolica, rh	Scopola										X									X	
474. Scorozonera Hispanica, rt																	X				
475. Scutellaria lateriflora, fl. hb	Scullcap																			X	
476. Serenoa serrulata, ft	Sabal																			X	X
477. Sesamum Indicum, f. o. s	Sesame Oil	X		X	X			X	X		X	X	X		X	X			X		X
478. Simaruba amara, rt. bk	Simaruba Bark							X				X	X						X		
479. Sempervivum tectorum, lv																	X				
480. Shorea Stenoptera, f. o. s	Shorea Oil												X								
481. Sinapis alba, s	White Mustard		X				X					X							X	X	X
482. Sinapis cernua, s	Jap. Mustard										X										
483. Smilax species, rt	Sarsaparilla	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S. medica	Mexican S				X		X			X		X			X		X			X	X
S. officinalis	Honduras S									X					X		X			X	X
S. ornata	Jamaica S																			X	X
S. papyracea	Para S																			X	X
S. syphilitica										X							X				
484. Smilax China, rh																	X				
485. Solanum Dulcamara, st	Bittersweet	X					X					X					X				
486. Solanum nigrum, lv							X					X					X				
487. Solanum tuberosum, stch. of tu	Potato Starch		X				X				X		X								
488. Spergularia rubra, hb																	X				

| | | |

Latin plant names	English names	Austrian	Belgian	British	Croatian	Danish	French	German	Hungarian	Italian	Japanese	Mexican	Netherlands	Norwegian	Russian	Servian	Spanish	Swedish	Swiss	U.S.P.VIII	U.S.P.IX
522. Triticum vulgare, flour fm. s	Wheat Flour						X														
523. Triticum vulgare, stch. fm. s	Wheat Starch	X	X	X		X	X			X		X	X	X	X	X	X	X			
524. Tussilago Farfara, fl	Coltsfoot Flowers						X														
525. Tussilago Farfara, lv	Coltsfoot Leaves	X				X		X			X			X	X		X				
526. Ulmus fulva, in. bk	Slippery Elm Bark																			X	X
527. Umbilicus pendulinus, lv																	X				
528. Uragoga Ipecacuanha, rt	Ipecac, Rio	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
529. Urginea maritima, bulb scales	Squill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
530. Urginea Indica, bulb scales	Indian Squill			X																	
531. Vaccinium myrtillus, ft	Blueberries	X										X	X					X	X		
532. Valeriana officinalis, rh. & rt	Valerian	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
533. Valeriana officinalis, v. o	Oil of Valerian	X																			
534. Valeriana Wallichii, rh. & rt	Indian Valerian			X																	
535. Vanilla planifolia, ft	Vanilla	X	X				X				X	X							X	X	
536. Veratrum album, rh. &. rt	White Hellebore		X					X	X			X						X	X	X	
537. Verbascum species, fl., without calyx	Mullein Flowers	X	X		X	X	X	X			X				X				X		
V. phlomoides		X			X	X		X			X				X				X		
V. thapsiforme					X	X	X	X			X				X				X		
V. Thapsus			X			X															
538. Veronica officinalis, hb	Speedwell					X	X														
539. Veronica Virginica, rh. & rt	Leptandra																			X	
540. Viburnum prunifolium, rt. bk	Black Haw Bark	X		X			X					X	X			X	X			X	X
541. Viburnum Opulus, bk	Cramp Bark																			X	
542. Vinca minor, lv	Periwinkle						X														
543. Viola odorata, fl	Violet Flowers						X			X		X					X				
544. Viola tricolor, fl. hb	Pansy	X						X											X		
545. Xanthoxylon Americanum, bk	N. Prickly Ash																			X	X
546. Xanthoxylon Clava-Herculis, bk	S. Prickly Ash																			X	X
547. Zea mays, styles & stigmas	Corn Silk						X					X					X			X	
548. Zea mays, stch. of s	Corn Starch		X	X																X	X
549. Zingiber officinale, rh	Ginger	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
550. Zizyphus vulgaris, ft	Jujube Berries										X						X				

523. French and German—T. sativum.
528. Italian and U.S.P. VIII and IX—Cephælis Ipecacuanha; U. S. P. VIII and IX—also from Cephælis acuminata (Carthagena Ipecac); British—Psychotria Ipecacuanha.
529. Belgian, French, Mexican, Netherlands, Russian and Spanish—Urginea Scilla.
536. U. S. P. VIII—also from V. viride (Am. Hellebore) and U. S. P. IX from V. viride only.
540. U. S. P. VIII and IX—also from V. Lentago.
546. U. S. P. VIII—Fagara Clava—Herculis.
549. Belgian—Amomum Zingiberis.

ABBREVIATIONS.

olr., oleoresin.
pfd., purified.
p., pure.
v.o., volatile oil.
s., seed.
lv., leaves.
bk., bark.
ext., extract.
exud., exudation.
g., gum, gummy.
fl., flower, flowering, florets.
rt., root.
rh., rhizome.
hb., herb.
ft., fruit.
res., resin.
fr., fresh.
wd., wood.
i.j., inspissated juice.
th., thallus.
tp., tops.
hd., head.
f.o., fixed oil.
st., stem.
fm., from.
emp., empyreumatic.
ht., heart.
lig., ligulate.
lf., leaflets.
in., inner.
pd., peeled.
ri., rind.
unr., unripe.
j., juice.
sc., sclerotium.
k., kernel.
co., corm.
sg., stigma.
pl., plant.
ster., sterile.
stch., starch.
bd., buds.
i.m.j., inspissated milky juice.
tu., tuber.
mu., mucilage.
h., hairs.
cl., cleansed.
bals., balsam.
spo., spores.

INDEX OF BOTANICAL NAMES NOT IN THE ALPHABETICAL LIST.

Acacia decurrens..... 7
Acacia Suma..... 8
Adiantum pedatum..... 15
Adonis æstivialis..... 16
Adonis autumnalis..... 16
Adonis cupaniana..... 16
Alsidium scholaris..... 24
Amomum Zingiberis..... 549
Amygdalus communis var amara..... 411
Amygdalus communis var. dulcis..... 413
Archangelica officinalis... 36
Arctostaphylos officinalis. 44
Aristolochia reticulata.... 46
Artemisia maritima..... 51
Artemisia pauciflora..... 51

Balsamodendron Africana 143
Barosma crenulata..... 61
Barosma serratifolia..... 61
Betula verruscosa..... 66
Brassica cernua..... 73
Brassica juncea..... 73,74
Brassica Rapa..... 75
Brayera anthelmintica.... 247

Canarium species..... 84
Cannabis indica..... 85
Capsicum minimum..... 88
Carbenia benedictus..... 134
Carum petroselinum..... 360
Caryophyllus aromaticus . 205
Centaurium minus..... 198
Cephælis Ipecacuanha.... 528
Cephælis acuminata..... 528
Chasmanthera palmata... 273
Chavica officinarum..... 393
Cinnamomum aromaticum..... 109
Citrus Bigarde..... 121
Citrus medica..... 131
Citrus sinensis..... 118
Cocculus palmata..... 273
Cola vera..... 139
Cucumis Colacynthis..... 116
Cucurbita maxima..... 164
Curcuma aromatica..... 168
Cymbopogon flexuosus... 172
Cynodon Dactylon..... 19
Cypripedium hirsutum... 176

Datura alba..... 179
Datura Metel..... 179
Datura Tatula..... 181
Dryopteris filix-mas..... 56
Dryopteris marginalis... 56

Elettaria repens..... 192
Embelia robusta..... 194
Eugenia aromatica..... 205

Fagara Clava-Herculis... 546
Fœniculum capillaceum.. 218
Fœniculum officinale..... 218

Garcinia morellæ..... 227
Gelsemium nitidum..... 230
Gloiopeltis species..... 229
Gonolobus Condurango... 308
Gnaphalium dioicum..... 37
Gracilaria species..... 229
Guaiacum sanctum... 243,244

Herniaria hirsuta..... 253
Hordeum distichon..... 257

Illicium anisatum..... 266
Ipomœa purga..... 212

Jambosa caryophyllus.... 205
Jateorhiza Calumba..... 273

Krameria argentea..... 281
Krameria Ixina..... 281

Lactuca altissima..... 282
Lappa vulgaris..... 43
Larix Europæa..... 285
Laserpitium latifolium.... 286
Laurus Camphora..... 108
Lavendula officinalis..... 290
Lavendula Spica..... 290
Majorana hortensis..... 343
Malva neglecta..... 303
Malva niceensis..... 303
Malva vulgaris..... 303
Melaleuca minor..... 311
Melilotus altissimus..... 312
Myroxylon balsamum.... 520
Myroxylon Pereiræ..... 519
Myroxylon Toluiferum... 520

Paullinia sorbilis..... 357
Payena species..... 349
Picea excelsa..... 2
Picrasma excelsa..... 369
Picrasma quassoides..... 369
Pimpinella magna..... 376
Polypodium filix-mas..... 56
Potentilla sylvestris..... 410
Psychotria Ipecacuanha.. 528

Quercus sessiflora..... 430
Quercus lusitanica var. infectoria..... 428

Rubus cuneifolius..... 452
Rubus nigrobaccus..... 452

Salva lavendulæfolia..... 457
Santalum Freycinetianum 462
Sassafras variifolium..... 465
Scopola japonica..... 473
Sesamum orientalis..... 477
Shorea Wiesneri..... 18
Simaruba officinalis..... 478
Sterculia acuminata..... 139

Tilia grandiflora..... 518
Triticum repens..... 19
Triticum sativum..... 523

Uncaria Gambir..... 348
Urginea Scilla..... 529

Veratrum viride..... 536
Viburnum Lentago..... 540
Vouacapoua Araroba..... 32

INDEX OF ENGLISH NAMES.

Acacia Bark..... 7
Aconite Leaves..... 11
Aconite Root..... 12
Acorns..... 430
Adder's-Tongue Starch... 200
African Pepper..... 88
Agar..... 229
Agaric, Surgeons..... 407
Agaric, White..... 408
Ajowan Oil..... 91
Allspice..... 372
Almond Oil..... 414
Aloes..... 20
Amber..... 377
Angelica..... 35
Anise..... 374
Apricot Seed..... 415
Areca Nut..... 45
Arnica Flowers..... 47
Arnica Leaves..... 48
Arnica Root..... 49
Asafœtida..... 214
Asarabacca..... 54
Asparagus Root..... 55

Bael Fruit..... 17
Balata..... 325
Balm..... 313
Balsam Copaiba..... 152
Balsam Peru..... 519
Balsam Tolu..... 520
Barberries..... 64
Bayberries..... 287
Bayberry Leaves..... 289
Bdellium..... 143
Bearberry..... 44
Beechwood Tar..... 213
Belladonna Leaves..... 59
Belladonna Root..... 60
Bengal Kino..... 77
Benzoin..... 495
Bermuda Arrowroot..... 306
Betel..... 390
Bistort..... 406
Bitter Almond..... 411
Bitter Chocolate..... 512
Bitter Orange Peel..... 121
Bitter Polygala..... 403
Bittersweet..... 485
Blackberries..... 450
Blackberry Bark..... 452
Black Cohosh..... 105
Black Haw Bark..... 540
Black Hellebore..... 252
Black Mustard..... 73
Black Pepper..... 395
Black Poplar Buds..... 409
Black Sassafras..... 111
Blessed Thistle..... 134
Bloodroot..... 461
Blueberries..... 531
Bogbean Leaves..... 323
Boldo Leaves..... 363
Boneset..... 210
Broom Tops..... 177
Buchu..... 61
Buckthorn Bark..... 434
Buckthorn Berries..... 433
Burdock Root..... 43
Burgundy Pitch..... 2,386
Butea Seeds..... 78

Cacao Beans..... 511
Cacao Butter..... 513
Calabar Beans..... 366
Calamus..... 13
Calumba..... 273
Camphor..... 108
Canada Turpentine..... 1
Canadian Hemp..... 41
Caoutchouc..... 254
Caraway..... 89
Cardamons..... 192
Cardamon Seed..... 193
Carnauba Wax..... 154
Cartagena Ipecac..... 529
Cascara Bark..... 435
Cascarilla Bark..... 160
Cashew Leaves..... 29
Cassia Bark..... 109
Cassia Pods..... 94
Castor Beans..... 441
Castor Oil..... 442
Catechu..... 8
Catechu, Pale..... 348
Celery Root..... 40
Centaury..... 198
Cera Pisang..... 327
Chamomile, English..... 38
Chamomile, German..... 309
Chamomile, Roman..... 38
Chamomile, Spanish..... 138
Chaulmoogra Oil..... 245
Chebulic Myrobalans..... 505
Cherry Laurel..... 417
Cherries, Sour..... 96
Cherries, Sweet..... 95
Chicory..... 104
Chinese Galls..... 439
Chios Turpentine..... 397
Chiretta..... 496
Chocolate, Bitter..... 512
Chrysarobin..... 32
Cinchona..... 106
Cinnamon, Ceylon..... 112
Cinnamon, Chinese..... 109
Cinnamon, Saigon..... 114
Cloves..... 205
Coca Leaves..... 201
Coconut Oil..... 137
Coffee..... 138
Cohosh, Black..... 105
Cola..... 139
Colchicum Root..... 140
Colchicum Seed..... 141
Colocynth..... 116
Coltsfoot Flowers..... 524
Coltsfoot Leaves..... 525
Condurango..... 308
Contrayerba..... 189
Copaiba..... 152
Coriander..... 156
Corn Silk..... 547
Corn Starch..... 548
Corsican Moss..... 23
Costmary..... 499
Cotton, Absorbent..... 239
Cotton Root Bark..... 241
Cotton Seed Oil..... 240
Couch Grass..... 19
Cramp Bark..... 541
Cranesbill..... 233
Cretan Dittany..... 342
Croton Oil..... 162
Croton Seed..... 161
Cubeb..... 391
Cumin..... 165
Currants, Red..... 440
Cusso..... 247
Cypress..... 166

Dammar..... 18
Dandelion..... 502
Dandelion Leaves..... 504
Dandelion Root..... 503
Datura Leaves..... 179
Datura Seed..... 180
Dill..... 361
Dragon's Blood..... 81
Duboisia..... 190

Elder Berries..... 459
Elder Berry Juice..... 460
Elder Flowers..... 458
Elecampane..... 268
Elemi..... 84
English Chamomile..... 38
Ergot..... 133
Eucalyptus..... 202
Euphorbium..... 211

False Hellebore..... 16
Fennel..... 218
Fennel Leaves..... 220
Fennel Root..... 221
Fenugreek..... 521
Figs..... 217
Flaxseed..... 295
Fleaseed..... 400
Foxglove..... 181
Fumitory..... 225

Galangal..... 22
Galbanum..... 215
Galeopsis..... 226
Galls..... 428
Galls, Chinese..... 439
Gambir..... 348
Gamboge..... 227
Garden Thyme..... 516
Gentian Root..... 231
German Chamomile..... 309
Ginger..... 549
Goldenseal..... 260
Grindelia..... 242
Ground Ivy..... 236
Guaiac..... 244
Guarana..... 357
Gum Ammoniac..... 186
Gum Arabic..... 9
Gum Asafœtida..... 214
Gum Balata..... 325
Gum Benzoin..... 495
Gum Euphorbium..... 211
Gum Galbanum..... 215
Gum Guaiac..... 244
Gum Gutti..... 227

Gum Myrrh..... 142
Gutta Percha..... 349

Hellebore, American..... 536
Hellebore, Black..... 252
Hellebore, False..... 16
Hellebore, White..... 536
Hemp, Canadian..... 41
Hemp, Indian..... 85
Hempseed..... 86
Henbane..... 262
Henbane Seed..... 263
Hops..... 258
Horehound..... 307
Horseradish Root..... 135
Hound's Tongue Root..... 174
Hyssop..... 265

Iceland Moss..... 97
Ignatia Beans..... 493
Indian Gum..... 33
Indian Hemp..... 85
Indian Pennywort..... 261
Indian Podophyllum..... 401
Indian Squill..... 530
Indian Tobacco..... 300
Indian Valerian..... 534
Ipecac, Cartagena..... 529
Ipecac, Rio..... 528
Irish Moss..... 235,102

Jaborandi..... 371
Jalap..... 212
Jambul Bark..... 207
Jambul Seed..... 208
Japanese Gentian..... 232
Japanese Mustard..... 482
Japanese Peppermint..... 316
Japanese Pokeroot..... 367
Java Plum..... 208
Jequirity Leaves..... 6
Jequirity Seed..... 5
Jujube Berries..... 550
Juniper Berries..... 275

Kamala..... 302
Kava Kava..... 394
Kefir..... 456
Kino..... 422
Kino, Bengal..... 77
Knot Grass..... 405
Kœsambi Oil..... 471
Kuzu Starch..... 424

Lactucarium..... 282
Ladanum..... 115
Ladies' Slipper Root..... 175
Lavender..... 290
Lemon..... 128
Lemon Balm..... 313
Lemon Juice..... 130
Lemon Peel..... 129
Lemon Seed..... 132
Leptandra..... 539
Lettuce..... 283
Levant Wormseed..... 51
Licorice..... 237
Lignum Vitæ..... 243
Lily-of-the-Valley Flowers..... 146
Lily-of-the-Valley Herb..... 147
Lily-of-the-Valley Root..... 148
Linden Flowers..... 518
Linseed..... 295
Linseed Oil..... 297
Logwood..... 246
Long Pepper..... 393
Lovage..... 294
Lupulin..... 259

Mace..... 331
Maidenhair..... 15
Male Fern..... 56
Mallow Flowers..... 304
Mallow Leaves..... 303
Malt..... 257
Mandrake..... 402
Manna..... 224
Marigold..... 82
Marjoram..... 343
Marshmallow Flowers..... 27
Marshmallow Leaves..... 25
Marshmallow Root..... 26
Mastic..... 396
Matico..... 389
Mexican Scammony..... 270
Mexican Tea..... 98
Mezereum..... 178
Milfoil..... 10
Motherwort..... 293
Mugwort..... 52
Mulberries..... 326
Mullein Flowers..... 537
Mustard, Black..... 73
Mustard, Japanese..... 482
Mustard, White..... 481
Myrobalans, Chebulic..... 505
Myrrh..... 142
Myrtle Fruit..... 333
Myrtle Leaves..... 334

Northern Prickly Ash Bark..... 545
Nutmeg..... 328
Nutmeg Butter..... 330
Nux Vomica..... 494

Oak Bark..... 429
Oil of Ajowan..... 91
Oil of Allspice..... 373
Oil of Amber..... 378
Oil of Am. Wormseed..... 99
Oil of Anise..... 267,375
Oil of Bergamot..... 127
Oil of Bitter Almond..... 412
Oil of Cade..... 278
Oil of Cajuput..... 311
Oil of Calamus..... 14
Oil of Caraway..... 90
Oil of Cassia..... 110
Oil of Chamomile..... 310
Oil of Cherry Laurel..... 418
Oil of Cinnamon..... 113
Oil of Cloves..... 206
Oil of Copaiba..... 153
Oil of Coriander..... 157
Oil of Cubeb..... 392
Oil of Curled Mint..... 318
Oil of Dill..... 362
Oil of Eng. Chamomile..... 39
Oil of Eucalyptus..... 203
Oil of Fennel..... 219
Oil of Fleabane..... 196
Oil of Juniper..... 276
Oil of Laurel..... 288
Oil of Lavender..... 292
Oil of Lemon..... 131
Oil of Lemon Balm..... 315
Oil of Lemon Grass..... 172
Oil of Mace..... 332
Oil of Mustard..... 74
Oil of Neroli..... 125
Oil of Nutmeg..... 329
Oil of Orange..... 120
Oil of Parsley..... 359
Oil of Pennyroyal..... 251
Oil of Peppermint..... 320
Oil of Pine Needles..... 4,387
Oil of Rose..... 447
Oil of Rosemary..... 449
Oil of Rue..... 455
Oil of Sandalwood..... 463
Oil of Sassafras..... 469
Oil of Savin..... 283
Oil of Spearmint..... 322
Oil of Sweet Birch..... 67
Oil of Tar..... 385
Oil of Thyme..... 517
Oil of Turpentine..... 380
Oil of Valerian..... 533
Oil of Wintergreen..... 228
Oleum Rusci..... 66
Olibanum..... 72
Olive Oil..... 339
Opium..... 351
Orange, Sweet..... 118
Orange Berries..... 123
Orange Blossoms..... 124
Orange Leaves..... 126
Orange Peel, Bitter..... 121
Orange Peel, Sweet..... 119
Oregon Grape..... 62
Orris..... 272

Pale Rose Petals..... 444
Pansy..... 544
Paprika..... 87
Pareira..... 101
Parsley Fruit..... 358
Parsley Root..... 360
Peanut Oil..... 42
Pearl Barley..... 256
Pellitory Root..... 30
Pennyroyal..... 250
Pepper, African..... 88
Pepper, Black..... 395
Pepper, Long..... 393
Pepper, Red..... 88
Pepper, Spanish..... 87
Peppermint..... 319
Periwinkle..... 542
Peru Balsam..... 519
Pharbitis Seed..... 269
Phellandrium..... 364
Pine Needle Oil..... 4,387
Pinkroot..... 489
Pipsissewa..... 100
Plantain..... 398

Poison Hemlock..... 144
Poke Root..... 368
Pomegranate Bark..... 425
Pomegranate Juice..... 426
Pomegranate Rind..... 427
Poppy Capsules..... 352
Poppy Leaves..... 353
Poppy Seed..... 354
Poppy Seed Oil..... 355
Potato Starch..... 487
Prickly Ash Bark..... 545
Prunes..... 416
Pulsatilla..... 34
Pumpkin..... 163
Pumpkin Seed..... 164

Quassia, Jamaica..... 369
Quassia, Surinam..... 428
Quebracho..... 57
Queen's Root..... 491
Quince..... 170
Quince Seed..... 171

Radix Caryophyllata..... 234
Rape Seed Oil..... 75
Raspberries..... 451
Red Cinchona..... 107
Red Currants..... 440
Red Gum..... 204
Red Poppy Petals..... 350
Red Rose Petals..... 445
Red Saunders..... 423
Rest Harrow..... 340
Rhatany..... 281
Rhubarb, Chinese..... 436
Rhubarb, European..... 437
Rice..... 346
Rice Starch..... 347
Rio Ipecac..... 528
Roman Chamomile..... 38
Rose Petals..... 445
Rosemary..... 448
Rosin..... 381
Rue..... 454
Russian Licorice..... 238

Sabal..... 476
Saffron..... 159
Sage..... 457
Salep..... 341
Sandalwood..... 462
Sandalwood Oil..... 463
Sandarac..... 83
Sappan..... 79
Sarsaparilla..... 43
Sassafras Bark..... 467
Sassafras Pith..... 465
Sassafras Root..... 466
Sassafras Wood..... 468
Savin..... 280
Saxifrage..... 376
Scammonium..... 150
Scammony Root..... 149
Scammony Resin..... 151
Scopola..... 473
Scouring Rush..... 195
Scullcap..... 475
Scurvy Grass..... 136
Seaweed Tents..... 284
Senega..... 404
Senna..... 92
Senna Pods..... 93
Serpentaria..... 46
Sesame Oil..... 477
Shorea Oil..... 480
Siam Benzoin..... 495
Simaruba Bark..... 478
Slippery Elm Bark..... 526
Soap Bark..... 431
Soapwort..... 464
Southern Prickly Ash..... 546
Sow Bread..... 169
Spanish Chamomile..... 158
Spanish Licorice..... 237
Spanish Pepper..... 87
Spanish Saffron..... 159
Spearmint..... 321
Speedwell..... 538
Squill..... 529
St. John's Wort..... 264
Star Anise..... 266
Stavesacre Seed..... 183
Storax..... 299
Stramonium..... 181
Stramonium Seed..... 182
Strassburg Turpentine..... 3
Strawberries..... 222
Strawberry Root..... 223
Strophanthus..... 492
Sumach Berries..... 438
Sumatra Benzoin..... 495
Sumbul..... 216
Sundew..... 189
Surgeon's Agaric..... 407
Swallow-wort..... 173
Sweet Almond..... 413
Sweet Almond Oil..... 414
Sweet Clover..... 312

Tacamahaca..... 191
Tamarinds..... 498
Tansy..... 500
Tapioca..... 305
Tar, Beechwood..... 213
Tar, Liquid..... 383
Tar, Solid..... 384
Tea..... 510
Texas Snakeroot..... 46
Thapsia Resin..... 509
Thapsia Root..... 508
Thyme..... 516
Tobacco..... 336
Tolu Balsam..... 520
Tonka..... 185
Tormentilla..... 410
Tragacanth..... 58
Triticum..... 19
Tupelo Tents..... 337
Turmeric..... 157
Turpentine, Canada..... 1
Turpentine, Chios..... 397
Turpentine, Crude..... 379
Turpentine, Strassburg..... 3
Turpentine, Venice..... 285
Turpeth..... 271

Uva Ursi..... 44

Valerian..... 532
Vanilla..... 535
Venice Turpentine..... 285
Violet Flowers..... 543
Virginia Snakeroot..... 46

Wahoo..... 209
Walnut Leaves..... 274
Water Cress..... 335
Water Germander..... 507
Wheat Flour..... 522
Wheat Starch..... 523
White Agaric..... 408
White Hellebore..... 536
White Mustard..... 481
Wild Cherry Bark..... 420
Wild Marjoram..... 344
Wild Thyme..... 514
Winter Cherry..... 365
Winter's Bark..... 188
Witchhazel Bark..... 248
Witchhazel Leaves..... 249
Wormseed..... 51
Wormwood..... 50

Yarrow..... 10
Yellow Jasmine..... 230
Yerba Santa..... 197

Zedoary..... 168

CORRECTIONS.

The following items should be deleted from the U.S.P. IX column:

41. Apocynum Cannabium, Canadian Hemp
130. Citrus Limonum, Lemon Juice
209. Euonymus Atropurpureus, Wahoo
241. Gossypium Herbaceum, Cotton Root Bark

In the list of pharmacopœias, the following items should be corrected as follows:

Farmacopea ufficiale del Regno d'Italia, 3d ed., 1909
Russian Pharmacopœia, 6th ed., 1910
Farmacopea Argentina, 1898
Farmacopea Venezolana, 1898

PHARMACEUTICAL FORMULAS

PROPOSED FOR A. PH. A. RECIPE BOOK

Thus far a collection of 114 Pharmaceutical Formulas has been compiled and published in THE JOURNAL, Vol. I, pp. 169, 366, 505, 637, 760 and 1307 (Feb. to Nov. 1912). Beginning with the March 1916 number these Formulas will be continued in monthly instalments by the Committee, and *all* members of the American Pharmaceutical Association are earnestly requested to render assistance by sending suitable formulas and criticisms to the Chairman,

OTTO RAUBENHEIMER, Brooklyn, N. Y.

Contributed by the Chairman:

No. 162.

SPIRITUS OPHTHALMICUS MITTENDORFII.

Mittendorf's Eye Spirit.

Spirit of Camphor,
Spirit of Lavender,
Spirit of Rosemary,
Brandy, of each, equal volumes.

Set aside for a few days before dispensing. This preparation is extensively prescribed by a New York eye specialist.

No. 163.

COLLYRIUM ADSTRINGENS LUTEUM.

Yellow Astringent Eye Wash.
Ph. Aust. VIII.

Ammonium Chloride	2 Gm.
Zinc Sulphate	5 Gm.
Water	890 Gm.
Camphor	2 Gm.
Alcohol, 68 percent	100 Gm.
Crocus	1 Gm.

Dissolve the salts in the water and add the solution of camphor in alcohol. Last, add the saffron, macerate for 24 hours, and then filter. Used in conjunctivitis.

No. 164.

TINCTURA FŒNICULI COMPOSITA.

Compound Tincture of Fennel.
(Romershausen's Augen Essenz.)
E. B. III.

Fennel, bruised	100 Gm.
Alcohol, 68 percent	500 Gm.
Oil of Fennel	1 Gm.

Macerate fennel in alcohol for 3 days at a temperature of 15 to 20°, filter, and add the oil.

Used as an eye wash diluted with water. (See No. 165.)

No. 165.

AQUA OPHTHALMICA ROMERSHAUSENII.

Romershausen's Eye Water.
E. B. III.

Comp. Tinct. of Fennel	1 part
Water	5 parts

No. 166.

AQUA OPHTHALMICA CONRADII.

Conrad's Eye Water.
F. M. G.

Zinc Sulphate	0.5 Gm.
Crocated Tinct. Opium, N. F. IV	1.5 Gm.
Distilled Water, a sufficient quantity,	
To make	150 Gm.

No. 167.

HARRINGTON'S SOLUTION.

Mercuric Chloride	0.8 Gm.
Hydrochloric Acid	60.0 mils
Water	300.0 mils
Alcohol	640.0 mils

This solution is recommended for hand disinfection, and it is also used for preparing the skin before incisions. On account of its sublimate content, it should be preceded by ether and followed by a little plain water.

No. 168.

RUBINI'S SOLUTION.

Rubini's Essence.

This is a saturated alcoholic solution of camphor. Three or four drops are taken on sugar against colds.

No. 169.

INJECTIO IODI.

Morton's Fluid.

Iodine	0.6 Gm.
Potassium Iodide	2.0 Gm.
Glycerin, a sufficient quantity,	
To make	30 mils

Used as an injection in tumors, from 2 to 4 mils according to size of tumor.

Contributed by Rudolf Lundgren:

No. 170.

LINIMENTUM PHENOLIS COMPOSITUM.

Compound Phenol Liniment.

Tinctura Antiodontalgica, Ph. Suec. IX.

(Toothache Drops.)

Phenol	2 parts
Menthol	2 parts
Eugenol	1 part

Liquefy the phenol, add the menthol and eugenol, and dissolve.

This produces an excellent toothache remedy, far superior to any other similar preparation.

No. 171.

WHITE SHOE DRESSING.

Liquefied Phenol	1 mil
Tragacanth, in fine powder	3 Gm.
Whiting	16 Gm.
Zinc Oxide	64 Gm.
Talc	96 Gm.
Water	100 mils

Triturate the powders until thoroughly mixed, and gradually add, with constant trituration, the water. Strain through wetted muslin with expression, and lastly, add the phenol.

A most excellent dressing for canvas shoes.

No. 172.

PULVIS DENTIFRICIUS Ph. SUEC. IX.

Dental Powder.

(Tooth Powder.)

Magnesium Carbonate	8 Gm.
Sodium Borate	8 Gm.
Oil of Peppermint	1 mil
Calcium Carbonate, Precipitated	83 Gm.

Triturate well and sift.

"As good as the best,
Better than most."

No. 173.

SOLUTION RED MERCURIC IODIDE.

Red Mercuric Iodide	1 Gm.
Sodium Iodide	1 Gm.
Distilled Water, a sufficient quantity,	
To make	10 mils

Intended chiefly for intramuscular injections.

(Cleveland City Hospital.)
(Lakeside Hospital, Cleveland.)

No. 174.

SPECIAL BURN OINTMENT.

Phenol	1 Gm.
Thymol	1 Gm.
Camphor	1 Gm.
Menthol	1 Gm.
Ichthyol	2 Gm.
Balsam of Peru	2 Gm.
Starch	20 Gm.
Zinc Oxide	20 Gm.
White Petrolatum	152 Gm.
To make	200 Gm.

Liquefy the first four ingredients by trituration in a mortar, and then add the next two and mix thoroughly. Now incorporate the zinc oxide together with the petrolatum. Lastly, add the starch in fine powder.

This ointment is sometimes used one-half strength.

(Clairton, Pa., Steel Mills.)
(City Hospital, McKeesport, Pa.)

Contributed by M. I. Wilbert:

No. 175.

MAGNESII PEROXIDUM CUM CRETA.

Magnesium Peroxide with Chalk.

(Oxygenated Tooth Powder.)

B. P. Cx.

Magnesium Peroxide	10.00 Gm.
Hard Soap, in powder	2.50 Gm.
Menthol	0.10 Gm.
Oil of Rose	0.26 mil
Oil of Wintergreen	0.52 mil
Precipitated Chalk, heavy, a sufficient quantity,	
To make	100 Gm.

Triturate the menthol with the oils, and mix intimately with 10 Gm. of the heavy precipitated chalk; then add the magnesium

peroxide, soap, and sufficient precipitated chalk to make up to the required weight; pass through a fine sieve.

Contributed by C. J. Spalding:

No. 176.

HONEY AND ALMOND CREAM.

Powdered Borax	15 Gm.
Powdered Castile Soap	135 Gm.
White Wax	30 Gm.
Spermaceti	165 Gm.
Sulphuric Acid	7 mils
Expressed Oil of Almond	120 mils
Glycerin	120 mils
Ext. Witch Hazel	60 mils
Alcohol	60 mils
Quince Seed, bruised	20 Gm.
Water, a sufficient quantity,	
To make	4000 mils

No. 1.—Add quince seed to 2000 mils of cold water. Let stand 24 hours, shaking frequently. Strain through muslin.

No. 2.—Melt soap in 1500 mils of boiling water and add borax, sulphuric acid and witch hazel.

No. 3.—Melt wax, spermaceti, glycerin, and oil of almond. Mix thoroughly and then add No. 1 quickly. Thoroughly agitate, and add No. 2 and boiling water to make 4000 mils. Cool, and when luke warm add the perfume oil. Let stand 4 days, shaking frequently, and again strain. Perfect success depends upon plenty of agitation.

No. 177.

PERFUME OIL.

Oil Bitter Almond	12 mils
Oil Bergamot	4 mils
Oil Lavender	10 drops
Oil Rose Geranium	4 mils
Oil Petit Grain	15 drops
Ext. Violet	4 mils
Ext. Carnation Pink	4 mils
Alcohol	60 mils

No. 178.

SOLDERING SOLUTION.

Zinc Chloride	480 Gm.
Glycerin	280 Gm.
Methyl Alcohol	480 Gm.
Water, a sufficient quantity,	
To make	10,000 mils

No. 179.

TINCT. QUININÆ COMP.

(Loomis.)

Quinine Sulphate	60 Gm.
Salicin	60 Gm.
Cinchona	1000 Gm.
Bitter Orange Peel	1000 Gm.
Alcohol	9000 mils
Water	2000 mils

Percolate the ground drugs with the menstruum and therein dissolve the chemicals.

No. 180.

ENGLISH TONIC.

(Freleigh.)

Tinct. Phosphorus N. F.	20 mils
" Calumba	50 mils
" Gentian	50 mils
" Matricaria	90 mils
" Nux Vomica	90 mils
" Ignatia	90 mils
" Aromatic	180 mils
" Cinchona	360 mils

No. 181.

CONDITION POWDER.

Charcoal, powdered	60 Gm.
Fenugreek Seed, powdered	60 Gm.
Exsiccated Ferrous Sulphate	150 Gm.
Gentian, powdered	210 Gm.

Dose: 15 Gm. on feed.

Contributed by the Chairman:

Historical notes should also prove of interest and might well be added to the formulas. The members of the Committee, as well as the readers of the JOURNAL, are requested to contribute such to the Chairman. A record of the origin and history of these formulas should certainly be preserved.

No. 115.

TINCTURA FERRI ACETATIS ÆTHEREA.

Klaproth's Tincture of Iron.

This tincture was originated in 1801 by the Berlin apothecary and founder of "mineral chemistry," Martin Heinrich Klaproth (1743–1817), and it became official in the Pharmacopœia Borussica and held its place up to and including the D.A.B. III. Hermann Hager, in 1863, improved the preparation of the solution and the tincture. Of late years this tincture is also becoming popular in the United States, being frequently prescribed.

HOME-MADE FIRE EXTINGUISHERS.

In many situations, especially in rural localities, an abundance of hand grenades for extinguishing fire is a very necessary precaution. They can easily be manufactured at a trifling cost.

The following three formulas are inexpensive and produce excellent results when placed in mineral water bottles, which are easily broken when required.

No. 182.

HAGNARD'S GRENADES.

Calcium Chloride	157 Gm.
Magnesium Chloride	56 Gm.
Water, a sufficient quantity,	
To make	1000 Gm.

No. 183.

HOWEN'S GRENADES.

Sea Salt	200 Gm.
Sal Ammoniac	90 Gm.
Water, a sufficient quantity,	
To make	1000 Gm.

No. 184.

"DEATH TO FIRE" GRENADES.

(Schwenberg.)

Sea Salt	65 Gm.
Solvay Salt	17 Gm.
Water, a sufficient quantity,	
To make	1000 Gm.

Solvay salt is anhydrous sal soda, or washing soda, manufactured by the Solvay process.

(Sc. Am., 1915, No. 22, 493.)

No. 185.

FIRE-PROOFING SOLUTION FOR FABRICS.

Boric Acid	50 Gm.
Borax	60 Gm.
Water	1000 mils

This formula was presented by the Director of the Municipal Laboratory in Paris to the Commission on Theatres.

The solution may be painted on the fabrics, or the material may be soaked in the solution and then dried either by exposure to the air or by means of hot irons. The advantages of this solution are cheapness, easy application and non-alteration of the material.

The fire-proofing action of the mixture is *not* due to the generation of an inert gas, but to the low fusing point of the chemicals, which form a layer or "glaze," which protects the fabric.

(La Nature, through Sc. A. Suppl. No. 2090.)

No. 186.

FIRE-PROOFING SOLUTION.

(Dr. Klut.)

Ammonium Phosphate	100 Gm.
Water	900 mils

According to Dr. Klut this solution does not attack the fabrics and is therefore superior to other solutions.

(Ph. Zhlle, 1904, No. 11, 115.)

No. 187.

TINCTURA QUININÆ AMMONIATA.

Ammoniated Tincture of Quinine.

B.P. 1914.

Quinine Sulphate	20 Gm.
Ammonia Water	100 mils
Alcohol, 60 percent	900 mils

Dissolve quinine sulphate in the mixed solutions, set aside for three days, and filter.

Dose: 2 to 4 mils.

No. 188.

UNGUENTUM GALLÆ CUM OPIO.

Gall and Opium Ointment.

"Pile Ointment."

B.P. 1914.

Powdered Opium	7.5 Gm.
Nutgall Ointment	92.5 Gm.

Triturate the opium with a portion of the nutgall ointment until smooth, then gradually add the remainder, mixing thoroughly by trituration.

No. 189.

UNGUENTUM PARAFFINI.

Paraffin Ointment.

B.P. 1914.

White Wax	3 Gm.
Paraffin	27 Gm.
Petrolatum	70 Gm.

Melt together and stir until cold. For white ointments use white petrolatum, and for colored ointments use the yellow variety.

REPORTS OF COMMITTEES

REPORT OF COMMITTEE ON QUALITY OF MEDICINAL PRODUCTS, AUGUST, 1915.*

During the past year there has been no improvement in the record of failure to keep ordinary solutions up to their standard strength. One Board reports over 18 percent of all samples as varying from standard. Forty-one samples of spirit of peppermint were of official strength, while twenty ranged from 24 percent to 80 percent of official strength. Nine samples of spirit of anise were of full official strength, while ten ranged from 0 percent to 89 percent. Nineteen samples of spirit camphor were full strength, while nine ranged from 65 percent to 85 percent. Seventeen samples of spirit wintergreen were all right, but one was 22½ percent. Twenty-seven samples of tincture iodine were of full strength, while twenty-two ranged from 33 percent to 84.5 percent. None of these products offer any difficulty in making or keeping, and it is hard to understand why they should be deficient. Forty-one samples of spirit nitrous ether were satisfactory, while sixty-four were not, ranging from 0.9 percent to 84 percent. This is not to be wondered at, as it is a very unstable product. Messrs. Lythgoe and Nuremberg, chemists for the Massachusetts State Board of Health, contribute very interesting data in relation to it. "A lot carefully made by the U.S.P. process was divided into six portions. A full bottle was kept in an ice-chest, a full white bottle in the laboratory, and a full amber bottle in the laboratory. An amber bottle, half full, was kept in the cupboard, a full white bottle and a full amber bottle in the sunlight. Another sample was made from a tube of concentrated nitrous ether and divided into two portions, one filling a bottle, one half filling a bottle and both kept in a cool place side by side. These samples were examined seven or eight times during nearly four months. The full bottle in the ice-chest showed absolutely no deterioration during this time and was kept in this condition for two years. The full bottle kept in the laboratory showed little deterioration during eighty days. Those kept half full and those kept in the sunlight showed marked deterioration, particularly the white bottle kept in the sunlight, which deteriorated completely in 83 days."

Their contention is that if a druggist complies with the requirement of the pharmacopœia and keeps his spirit nitrous ether in small, full, amber bottles in a cool place, he will have no trouble in dispensing full strength, if prepared within three or four months. Instead, not a few use from a large bottle that is carelessly stored and before it is used are dispensing a very inferior product.

It is of interest to note the reading of the alcoholic solutions in the polariscope and refractometer. Camphor, 5 Gm. in alcohol to make 100 Cc., has an optical rotation of + 2.2°. Camphor, 10 Gm. in alcohol to make 100 Cc., has an optical rotation of + 4.35°. Camphor, 5 Gm. in alcohol to make 100 Cc., has a refractometer reading of 1.3678 at 24° C. Camphor, 10 Gm. in alcohol to make 100 Cc., has a reading of 1.3730 at 24° C., alcohol has a reading of 1.3620 at 24° C. Increase for first 5 Gm., 0.0058, second 5 Gm., 0.0052 at 24° C.

There are still numerous calls for tablets and pills containing volatile or easily oxidizable substances which cannot be retained in the mass, so that impairment is inevitable soon after being made.

An effort is being made in some directions to obtain a guarantee of the keeping qualities of all products, but this is not practicable. A product carefully stored by one dealer would be good for many months, while carelessly stored by another will very quickly spoil. Beef, iron and wine in one store, kept away from direct sunlight, may keep a year; placed in the window, exposed to sunlight, the same product may spoil inside eight to ten days. Again, there is marked difference of opinion as to the keeping qualities of various products. Some imagine that digitalis leaves or digitalis fluid extract very soon deteriorate. Manufacturers know this is not so. Examination of these products properly kept over two years shows no

* Scientific Section, San Francisco meeting.

change. In the November, 1914, issue of the JOUR. OF THE AM. PH. ASSOC., p. 1559, the statement is credited to Prof. Hatcher that leaves twenty years old have assayed better than leaves a year old. Tinctures ten years old tested, as well as those freshly made and of several fluid extracts, one, fifteen years old, had the highest test. Then it is important to know whether the value of a product is determined by accurate chemical test or inaccurate physiological experiment. This feature is brought out very clearly in the excellent paper by Prof. Wm. C. Alpers, p. 715 of the June, 1915, JOURNAL. On p. 720 he cites the instance of standardized tinctures, being put upon the market with certificate of strength, being returned as unknowns to their source of origin, to have some samples pronounced as worthless and some as over-strong. Different lots of any drug will vary as locality of growth, soil, degree of moisture, sunshine, etc., varies. In addition to this the ignorant admixture of crude drugs that have similar characteristics brings about variation as suggested by Prof. J. U. Lloyd, p. 87 D. C. Tests of identity by chemical reaction, development of color, etc., may be of no value where the article tested is a mixture. This is well illustrated by the worthless color tests applied to methyl salicylate, oil of birch and true oil of wintergreen. It is also brought out in the tests for cod-liver oil. Mixtures of this oil and other fish-liver oils and with seal oil can be made to pass the color tests. Careful comparison with a known pure sample may show some differences in color that would not be distinguished without such standard comparison. The refractive index is of value in differentiating different pure products, but may be misleading with mixtures.

The following results explain our statement:

	Dogfish Oil (Shark fish Oil)	Seal Oil Refined	Norwegian C. L. Oil	Newfoundland C. L. Oil
Color	Yellowish brown or amber	Very pale yellow	Pale yellow	Decided yellow.
Odor	Offensive.	Not disagreeable.	Not disagreeable.	Not disagreeable.
Saponification Number	161.6	192.4	185.5	
Sp. gr. at 25° C.	0.915	0.920	0.922	0.922
Refractive Index at 23° C.	1.4748	1.4751	1.4779	1.4788
Reduction of temperature	Slight turbidity −6° C. Semi-solid −8.5° C. Solid −13° C.	−6° C. −15° C.	Thickened −6° C. Opaque −13° C.	Thickened −5° C. Semi-solid −13° C.
Sulphuric acid on rod	Brilliant violet purple changing to reddish brown.	Slight blue changing to dirty brown or black.	Violet to brown red or amber.	Deep violet to dirty brown black.
Sulphuric acid and chloroform	Light blue to violet and violet red.	Reddish brown.	Violet to reddish brown.	Blue to reddish brown.
Fuming Nitric Acid	Deep rose violet to decided brown.	No color—after a time faint violet.	Rose red to lemon yellow.	Violet to permanent brown.

The character of these color reactions can be varied by amount of acid used in relation to oils and by temperature. Then the quality of the fuming nitric acid modifies this test, which is apparently the best for identifying a pure Norwegian oil. A mixture of seal oil 1 and Norwegian oil 3 volumes tests little different from the straight Norwegian oil, while seal oil 2 and Norwegian oil 2 volumes reacts with the sulphuric acid tests all right, while giving a darker end color with fuming nitric acid. Here again, do we know in any case what we are testing? The Newfoundland oil was said to be from the true cod only (Gadus morrhua). The books tell us the Norwegian oil is from the ling, coalfish, dorse, pollock and other varieties of Gadus. The Fish Commissioner of Norway testified not long since before an American Court that Norwegian oil is from Gadus morrhua only. Who knows the truth about the matter?

The year has been unique in the experience of any person now living. The interruption to the collection of approximately half of the staple foreign drugs, caused by the great war, and even more to their transportation, has carried us back toward a period a century earlier, when ocean transportation was scanty. These conditions have worked in a variety of ways

to disarrange the drug market. Many of the collectors in the regular regions are new and inexperienced and are contributing drugs which are not clean, not judiciously collected and not properly preserved. These conditions are still worse when the drugs come from regions which have not heretofore contributed them. Accidental admixture or substitution has thus occurred. The scarcity has resulted in high prices and this has encouraged some intentional adulteration.

These conditions have lent special value and importance to the federal supervision of drug imports. Those who believe that there is little intentional sophistication of crude drugs are not in a position to realize the force of this fact. It is true that the sophistication of drugs in foreign countries is a regularly organized and extensive business, and is always ready to take advantage of such situations as that now existing. But for the federal authorities' suppression of the first attempts in this direction, the United States would have received a flood of sub-standard drugs during the past year. As it is, we have suffered from a very great scarcity, almost a famine in some articles, but the quality has been well maintained.

Some drugs, formerly peculiarly subject to adulteration, have attained to almost ideal conditions as to grade. Among such may be mentioned saffron, papaw juice, horehound, insect flowers, pareira brava, cardamom seeds, matico and senna siftings. Up to a year or two since, practically all dried papaw juice imported was heavily adulterated with starch or starchy substances and with the dried pulp of the plant. When this was rejected there was a great outcry. It was declared that no other grade was obtainable and that the market would be unable to get supplies. Rejection was persistent and unyielding, with the result that not only are shipments almost always pure, but new and improved methods of drying have been introduced and the quality is very superior to what it was. In the meantime, a new method of adulterating has been tried. The usual method was to break up dried rice bread and mix the fragments through those of the papaw juice. The new method is to dip the bread fragments in the fresh milk-juice, so as to thoroughly coat it. It is always necessary to break the lumps up and not to decide by the superficial appearance.

Attempts to substitute scopola for belladonna root, or to mix it, have been renewed, but were quickly suppressed. In one case, the Japanese scopola was employed.

Similarly there has been a slight attempt at adulteration of belladonna leaves with phytolacca and with scopola leaves. The most serious thing was the shipment from Italy of a lot of herbage of Physalis Alkekengi for belladonna leaves, detected by Mr. Mel, of the New York Laboratory. One shipment of belladonna leaves was quite hairy; so much so, that their identity was questioned.

Of late, persistent attempts have been made to import spurious ipecac, the stimulus coming, doubtless, from its exceptionally high price. There has been more shipping of spurious ipecac in the last six months than in the preceding ten years. Needless to say, none of it has reached the channels of trade. Three different tropical roots have been used for this purpose. A curious effect of sea-water on ipecac has been observed. A shipment of this drug went down with a sunken steamer in New York harbor. When the steamer was raised, the ipecac was dried and presented a good appearance, but on assay it was found to contain scarcely any alkaloid.

The addition of stems to drugs which should contain little, if any, has been quite common this year and has specially affected buchu, cubeb, hyssop, thyme, and lavender flowers. These and other drugs have also been unusually dirty and sandy.

What is there in cubeb that leads analysts astray? One state official condemned a popular brand of bronchial lozenges as containing opium and stated that their sale was illegal. As no opium or derivative of opium had ever been on the premises of the manufacturer, the report was a great surprise. He was unable to get a satisfactory statement as to method of examination or unable to get a sample of the lot analyzed, but the official maintained that his work was corroborated by a published formula. If he had looked further he would have found three other published formulas all different. The publication of four different formulas based on examination of a product and none of them agreeing with the original is not very complimentary to the accuracy of organic analysis. Another official claimed to have found conium in the lozenges, but none was ever put in by the manufacturer. Another state official condemned a cubeb bronchial lozenge as containing opium, but it was not there

and from the character of its manufacture could not have been there. If any one can throw any light upon the cause of such wild and injurious statements it would be a public benefit.

TABLE.

Acid Trichloracetic.—None of the lots examined gave a faint reddish color with $FeCl_3$ as required by the U.S.P., but even reagent acids refuse to conform to this test.
C. E. VANDERKLEED.

Aconite Leaf.—One sample. 0.355 alkaloid. Standard, 0.2 ether soluble alkaloids.
C. E. VANDERKLEED.

Aconite Root.—Five samples. Highest, 0.626. Lowest, 0.360. Average, 0.497. Standard, 0.5 ether soluble alkaloids. C. E. VANDERKLEED.

Aloes.—One sample submitted contained no aloin. W. L. SCOVILLE.

Althæa.—Cut althæa, thinly coated with milk of lime, as Jamaica ginger and German calamus are treated, is of frequent appearance. It is now recognized that other drugs are adulterated when so treated and it would seem that the same view should be taken of this.
H. H. RUSBY.

Alum Dried and Powdered.—Great improvement in moisture content has been noted, none of the samples containing more than 6 percent, which is very close to our arbitrary standard of 5 percent moisture. C. E. VANDERKLEED.

Two percent water, 1 percent insoluble, 2 percent water, 1.3 percent insoluble, 2.5 percent water, 1 percent insoluble. E. L. PATCH.

Areca Nut.—A shipment of areca nuts, of very good appearance externally, was found when broken to consist of more than 50 percent of wormy, mouldy and decayed material entirely unfit for use. H. H. RUSBY.

Asafœtida.—Alcohol soluble, 63 percent, ash, 15 percent, ash standard, 10 percent; alcohol soluble, 51 percent, ash, 14 percent; alcohol soluble, 65 percent, ash, 11 percent; alcohol soluble, 58 percent, ash, 14 percent; alcohol soluble, 58 percent, ash, 18 percent. E. L. PATCH.

Alcohol soluble, 61.9 percent, ash, 13.1 percent; alcohol soluble, 59 percent, ash, 22.5 percent. C. E. VANDERKLEED.

Six lots ranged from 36 percent soluble in alcohol to 77.3 percent, and from 40 percent ash to 2.06 percent. Five contained more than 66 percent alcohol soluble matters.
W. L. SCOVILLE.

Balsam Peru.—Specific gravity, 1.157, cinnamein, 53 percent; specific gravity, 1.15, cinnamein, 60 percent; specific gravity, 1.150, cinnamein, 63.6 percent; specific gravity, 1.156, cinnamein, 56 percent.

In answer to criticism of a lot, a leading importer sent the following: "This balsam is of our own direct importation from San Salvador and is absolutely pure and genuine. It does not, however, strictly comply with the U.S.P. requirements in that the percentage of cinnamein is slightly less than the minimum called for, and it varies a little as to specific gravity and acid value. Although we are very large importers of this article, handling about 60 percent of the country's total importation, and testing every parcel that comes to us, we very rarely, in fact practically never, find any balsam that is strictly U.S.P. This condition has been recognized by the federal authorities and will doubtless be taken notice of by the U.S.P. Revision Committee, now at work on the next edition." E. L. PATCH.

Extract of Beef.—Liable to find it low in proteids, requiring an additional quantity to be used to obtain a beef, iron and wine that will meet the standard.

	Percent	Percent	Percent	Percent	Percent
Moisture	17	20	20	20	20
Salt	16.5	18.5	11.6	18.68	4.5
Proteid	47.69	41.44	48.75	36.56	55

E. L. PATCH.

Beef, Iron and Wine.—Several samples low in iron and proteids were classified as beverages and obliged to pay liquor tax. E. L. PATCH.

Belladonna Leaves.—Three samples. Highest, 0.350. Lowest, 0.247. Average, 0.300. Standard, 0.300. C. E. VANDERKLEED.

Three-tenths percent, 0.37 percent, 0.37 percent, 0.3 percent. E. L. PATCH.

Of late much adulteration, from 20 percent to 80 percent of added leaves of poke root, scopola or ailanthus. HAROLD DEAN.

Belladonna Root.—Seven samples. Highest, 0.640. Lowest, 0.424. Average, 0.511. Standard, 0.45. C. E. VANDERKLEED.

Benzoin.—Five lots ranged between 67.8 percent and 76.5 percent in alcohol solubility and 0.96 percent and 1.62 percent ash. C. E. VANDERKLEED.

Six lots yielded from 78 percent to 87.3 percent alcohol soluble constituents. W. L. SCOVILLE.

Blaud Pills.—Contain from 77 percent to 182 percent of claimed Iron Carbonate contents. AMER. PHAR. ASSOC. JOUR., May, 1915.

Bloodroot.—One sample. 3.98 percent alkaloids. Standard, 2.5 percent. C. E. VANDERKLEED.

Ten lots gave 1.77 percent to 7.01 percent alkaloids. Seven of the ten contained 5 percent or more. W. L. SCOVILLE.

Blue Mass Powder.—Two lots contained 32 percent and 31.3 percent metallic mercury, both below the standard of 33 percent. C. E. VANDERKLEED.

Buchu.—A number of shipments of spurious buchu, representing several species, have been received. On investigation it was found that the error was due to the ignorance of the collectors. H. H. RUSBY.

Burdock Root.—One lot ground had 20.8 percent ash. Usually has from 7 percent to 10.5 percent. E. L. PATCH.

Calcium Carbonate C. P. Ppt.—Usually gives slight precipitate in test for limit of iron, aluminum and phosphates. C. E. VANDERKLEED.

98.85 percent, 98.35 percent, 98.85 percent, 98.85 percent, 98.35 percent, $CaCO_3$. E. L. PATCH.

Calcium Chloride.—One lot left 1.4 percent residue in U.S.P. test for magnesium and alkalies, while the standard is only 0.1 percent. C. E. VANDERKLEED.

Calcium Phosphate Precipitated.—Contained 1 percent chloride. Lot 2, 1.2 percent. Three lots traces only. E. L. PATCH.

One lot contained chloride in excess of U.S.P. allowance. C. E. VANDERKLEED.

Cannabis Indica.—The genuine Cannabis indica of former days has become rather unusual, various forms of cannabis herb, often very seedy, from various countries having replaced it. H. H. RUSBY.

Cantharides.—Six samples Chinese cantharides. Highest, 1.1. Lowest, 0.570. Average, 0.869. One sample of Russian, 0.625. Standard, 0.6 percent cantharidin. C. E. VANDERKLEED.

Cantharidin contents range from 0.55 percent to 1.15 percent. W. L. SCOVILLE.

Capsicum.—Six samples. Highest, 20.84 percent oleoresin. Lowest, 13.85 percent. Average, 16.65 percent. Standard, 10 percent. C. E. VANDERKLEED.

Alcoholic extract from six samples, 20 percent to 24.2 percent. Ash, 5.2 percent to 10 percent. E. L. PATCH.

Cardamom.—"Green Cardamoms" have arrived in considerable quantity. These cardamoms have a thin, tough, greenish-brown surface and have not been bleached. This variety is of excellent quality. H. H. RUSBY.

Cascarilla.—Bark has become very poor, being mostly the scrapings of small limbs and twigs. It would appear that this shrub is now almost exterminated in the wild state. H. H. RUSBY.

Cherry Juice.—Specific gravity, at 25° C., 1.055; residue, 19 percent; alcohol, 11.72 percent; vol. 10 Cc. = 0.4 Cc. normal KOH solution. Specific gravity, 1.037; residue, 14.8 percent; alcohol, 14.5 percent; vol. 10 Cc. = 0.35 Cc. normal KOH solution.

Specific gravity, 1.048; residue, 15 percent; alcohol, 13.26 percent; vol., 10 Cc. = 0.4 Cc. normal KOH solution.

Specific gravity, 1.062; alcohol, 16.2 percent; residue, 22.7 percent; 10 Cc. = 0.35 Cc. normal KOH solution.

Specific gravity, 1.055; alcohol, 11.72 percent; residue, 19 percent; 10 Cc. = 0.4 Cc. normal KOH.

Specific gravity, 1.007; alcohol, 23.04 percent; residue, 8.5 percent; 10 Cc. = 0.7 Cc. normal KOH. E. L. PATCH.

Chondrus.—Great quantities of chondrus have arrived in an unbleached state, very dark and quite sandy and dirty. It is usually imported as "French moss" or "crude moss." We find that this is mostly used for kalsomining. H. H. RUSBY.

Chromium Sulphate.—Two lots examined assayed 85.4 percent and 87.1 percent $Cr_2(SO_4)_3$, respectively. C. E. VANDERKLEED.

Cinchona, Red.—One lot, 8.35 percent. Yellow cinchona, ten lots, highest, 11 percent, lowest, 6.5 percent. Average, 8.56 percent. Standard, 5 percent total anhydrous alkaloid. C. E. VANDERKLEED.

Coca Leaves.—One lot, 1.053 percent. Standard, 0.5 percent ether soluble alkaloids. C. E. VANDERKLEED.

One lot, 0.93 percent. E. L. PATCH.

Cocculus indicus.—Two shipments of cocculus indicus or fish berries have come under the name of "Sumac," an error that we have not been able to explain. H. H. RUSBY.

Colchicum Seed.—Three lots. Highest, 0.850 percent. Lowest, 0.660 percent. Average, 0.780 percent. Standard, 0.45 percent colchicine. C. E. VANDERKLEED.

Colchicine.—Continues to contain excessive amounts of chloroform and moisture. Thirteen lots lost 2.2 percent, 4.2 percent, 8.3 percent, 9.1 percent, 9.3 percent, 10.3 percent, 10.6 percent, 12.1 percent, 12.6 percent, 12.7 percent, 12.9 percent, 22.3 percent, and 29.2 percent of their weight at 102° C., the loss in each case, with the exception of the 4.2 percent figure, being chiefly due to chloroform. This lot lost moisture only. There is probably no excuse for the excessive quantities of chloroform left in this alkaloid, as it is readily driven off on heating without appreciably affecting the color of the alkaloid. It is difficult to obtain a good qualitative reaction with U.S.P. hydrochloric acid-ferric chloride-chloroform test if the mixture is heated only to boiling, as required by the U.S.P., but if the boiling is continued one or two minutes, guarding against excessive evaporation, a good reaction is always obtained. C. E. VANDERKLEED.

Cramp Bark.—Spurious cramp bark has this year been seized in interstate commerce. Efforts to secure orders for genuine cramp bark have not met with much success. H. H. RUSBY.

Cresol.—Only two of sixteen lots examined had a specific gravity within the U.S.P. limits of 1.036–1.038, these two giving 1.037 and 1.038, respectively. One was 1.039, one 1.016 and the other twelve ranging from 1.030 to 1.033. All of the samples answered the requirements of 90 percent distilling between 195° and 205° C., except one of which 86 percent distilled. It is almost impossible to obtain a cresol soluble in 60 parts of water, but as a rule the insoluble portion is very small in amount. All other U.S.P. requirements were met by the samples. C. E. VANDERKLEED.

Dandelion Root.—Lot of powdered, 45 percent ash. Usually 9 percent. E. L. PATCH.

Digitalis Leaves.—Two samples. Highest, 0.365 percent. Lowest, 0.293 percent. Average, 0.329 percent. Standard, 0.25 percent digitoxin. C. E. VANDERKLEED.

0.27 percent, 0.30 percent, 0.28 percent, 0.26 percent. Ash, 8 to 9.5 percent. E. L. PATCH.

Ergot.—Six lots. Highest, 0.380 percent. Lowest, 0.115 percent. Average, 0.256 percent. Standard, 0.15 percent cornutine. C. E. VANDERKLEED.

Formaldehyde.—Lot, 38.2 percent. Formaldehyde contained copper. E. L. PATCH.

All examined exceeded the U.S.P. requirements of 1.075 to 1.081 in specific gravity. The average was between 1.082 and 1.087. Most gave reactions for chloride, sulphate and calcium, but were otherwise U.S.P. C. E. VANDERKLEED.

Gelsemium.—Four lots. Highest, 0.849 percent. Lowest, 0.503 percent. Average, 0.630 percent. Standard, 0.4 percent alkaloids. C. E. VANDERKLEED.

Ginger, African.—Two samples. Highest, 8.90 percent. Lowest, 7.99 percent. Average, 8.44 percent. Standard, 6 percent oleoresin. C. E. VANDERKLEED.

Ginger, Jamaica.—One sample, 3.93 percent. Standard, 4 percent oleoresin. C. E. VANDERKLEED.

Alcoholic extract, 7.7 percent, 4.4 percent, 4.4 percent, 6.3 percent, 4.5 percent, 4 percent, 4.9 percent, 6.2 percent, 5.3 percent, 5 percent, 6.5 percent, 5.3 percent, 4.4 percent, 6 percent, 4.5 percent. E. L. PATCH.

Guaiac.—Alcohol solubility ranged between 77.5 percent and 99.2 percent, only one being below the U.S.P. standard of 85 percent. Ash ranged between 0.51 percent and 5.7 percent, only one being above the U.S.P standard of 4 percent. C. E. VANDERKLEED.

Yielded from 70.3 percent to 97 percent alcohol soluble matter. Four out of fourteen lots were below 80 percent, and seven between 80 percent and 90 percent. W. L. SCOVILLE.

Black Hellebore Root.—

Ash per cent.	Extract per cent.	Ash per cent.	Extract per cent.
8.4	31.7	9	30
7	30	7	31
9.5	22	5	30.8
9	23	8	31.8
10	21.9	7.5	30.8
10	23	8	31.2
7.5	31.2	8.5	31
6	32	6.5	30

E. L. PATCH.

Hellebore, White.—One lot powdered, 1.41 percent alkaloid. Others, 1.04 percent, 0.9 percent. Ash, 11 percent to 13 percent. E. L. PATCH.

Hydrastis.—Five samples. Highest, 3.98 percent. Lowest, 3.16 percent. Average, 3.63 percent. Standard, 2.5 percent hydrastine. C. E. VANDERKLEED.

One lot only 2.7 percent ether soluble alkaloid. W. L. SCOVILLE.

3.2 percent, 4 percent, 4.2 percent alkaloid hydrastine. E. L. PATCH.

Hydrogen Peroxide.—Twenty-three lots examined were satisfactory with the exception that two gave total solids of 0.0479 and 0.340 Gm. per 20 Cc. instead of 0.030 as required by the U.S.P. C. E. VANDERKLEED.

Hyoscyamus.—Twenty lots. Highest, 0.140 percent. Lowest, 0.031 percent. Average, 0.073 percent alkaloids. Standard, 0.08 percent. C. E. VANDERKLEED.

Alkaloid, 0.084. Ash, 27 percent. Alkaloid, 0.700. Ash, 35.8 percent. E. L. PATCH.

Annual or "seedling" henbane continues to arrive. The greatest defect is the large amount of earth adhering. When clean, its assay figure is usually good. H. H. RUSBY.

Infusorial Earth.—If used for filtering purposes must be watched closely for carbonate. Even insoluble carbonates are detrimental and carbonates are frequently found. W. L. SCOVILLE.

Ipecac.—Six lots whole. Highest, 2.380 percent. Lowest, 1.846 percent. Average, 2.221 percent. Three lots powdered. Highest, 2.130 percent. Lowest, 1.666 percent. Average, 1.872 percent. Standard, 1.75 percent. C. E. VANDERKLEED.

1.71 percent, 2.28 percent, 1.85 percent, 1. 96 percent. E. L. PATCH.

One lot of Rio, 1.67 percent. W. L. SCOVILLE.

Fluid extract ipecac proved to be an aqueous solution of tartar emetic colored with caramel. N. A. R. D. JOURNAL.

Iron Sulphate Dried.—Continues to vary greatly in $2FeSO_4 \cdot 3H_2O$ content; 15 lots ran 80 percent, 83.1 percent, 88.5 percent, 91.3 percent, 91.9 percent, 92.3 percent, 92.6 percent, 93.4 percent, 93.4 percent, 95.2 percent, 96 percent, 96 percent, 99 percent, 103 percent and 104.3 percent. C. E. VANDERKLEED.

Jaborandi.—One lot, 1.06 percent. Standard, 0.5 percent. C. E. VANDERKLEED.

Jalap.—One sample, 7.17 percent. Standard, 7 percent total resin. C. E. VANDERKLEED.

Jalap Resin.—One lot was not completely soluble in five times its weight of ammonia water. C. E. VANDERKLEED.

Keiselguhr.—Much offered for pharmaceutical use; contains organic matter from which it should be freed by ignition. C. E. VANDERKLEED.

Kola.—Ten lots. Highest, 2.02 percent. Lowest, 1.4 percent. Average, 1.582 percent. Standard, 1 percent. C. E. VANDERKLEED.

Lime Chlorinated.—Standard, 30 percent chlorine. 20 percent available chlorine, 8 percent, 10 percent; 34 percent available chlorine, 30.7 percent, 33.7 percent.

E. L. PATCH.

Liniment of Camphor.—10 percent, 35 percent, 66 percent, 69 percent of official.

N. A. R. D. JOURNAL.

Lobelia Herb.—One lot, 0.5910. Standard, 0.5 percent. C. E. VANDERKLEED.

0.520 percent to 0.56 percent. E. L. PATCH.

Lupulin.—Ten lots gave ether soluble portion 55.5 percent, 55 percent, 57.1 percent, 58.6 percent, 54.7 percent, 67.6 percent, 55.3 percent, 44.2 percent, 69.2 percent and 68.2 percent. Ash, 8.23 percent, 7.72 percent, 7.6 percent, 10.7 percent, 19.4 percent, 13.3 percent, 18.3 percent, 28.4 percent, 12.8 percent and 14.4 percent. The U.S.P. requires 60 percent soluble in ether and 10 percent ash. C. E. VANDERKLEED.

Five lots varied from 2.5 percent to 14.1 percent ash. Conditions have improved with this article. W. L. SCOVILLE.

Magnesia Calcined.—Water, 10 percent, 96.14 percent MgO in ignited residue; water, 4 percent, 93.7 percent MgO in ignited residue; water, 5 percent, 95.93 percent MgO in ignited residue; water, 5 percent, 96.2 percent MgO in ignited residue.

E. L. PATCH.

One lot contained only 93.9 percent MgO after ignition. U.S.P. requires 96 percent. None of the lots examined the past year gelatinized with water as required by the U.S.P. and most contained an excess of calcium over the U.S.P. limits. C. E. VANDERKLEED.

Varies much in its lightness. Uniformity in this respect is very desirable for stock preparations, but less important for other purposes. W. L. SCOVILLE.

Magnesium Carbonate.—Two of six lots were low in MgO after ignition, assaying 92.6 percent and 94.8 percent, respectively. Five of the six contained calcium in excess of U.S.P. limits. Otherwise all were U.S.P. C. E. VANDERKLEED.

Varies in density. W. L. SCOVILLE.

Magnesium Carbonate.—44.4 residue representing 92.93 percent MgO; 45 percent residue representing 92.58 percent MgO; 45 percent residue representing 93.03 percent MgO; 44 percent residue representing 92.86 percent MgO; 44 percent residue representing 94.69 percent MgO; 44 percent residue representing 91.95 percent MgO. E. L. PATCH.

Magnesium Sulphate.—Dried, purified, gave usual variation in water content. Five lots contained 14.9 percent, 26.9 percent, 27.7 percent, 29.8 percent and 31.5 percent.

C. E. VANDERKLEED.

Magnesium Sulphate.—Cryst. Of 15 lots, only one was free from chloride. The others contained from a trace to 0.5 percent. E. L. PATCH.

Manaca.—There has been considerable dispute over the identity of genuine manaca, a drug that is coming to be used very extensively. The manaca that was formerly most seen was cylindrical, purplish-brown, smoothish and mostly of the thickness of the fingers. Then sometimes came, and of late usually, an irregular, thick, heavy, hard, tapering root with a surface covered with a scaly, tissue-like membrane. It was a question which was genuine until we found both attached, the former being the stem, the latter the root.

H. H. RUSBY.

Manganese and Ammonium Citrate.—Mn_3O_4, 26 percent, 26 percent, 26 percent, 26 percent, 24 percent. E. L. PATCH.

Manganese Dioxide C. P.—One lot contained some insoluble residue in test for antimony sulphide and insoluble substances, but was otherwise U.S.P.

C. E. VANDERKLEED.

Manganese Sulphate.—Continues to vary greatly in water content. Seven lots gave 29.4

percent, 31.7 percent, 32.3 percent, 32.5 percent, 35.9 percent, 37.3 percent and 37.4 percent. Four were above the U.S.P limit of 32.3 percent. These figures for moisture were obtained by employing the lowest possible red heat on the manganese sulphate in a porcelain crucible. The U.S.P. directs gentle ignition. Different loss is occasioned by different degrees of ignition. C. E. VANDERKLEED.

Methyl Alcohol.—40 percent found in a hair lotion.

JOUR. AM. PH. ASSOC., Jan. 15, Page 135.

Methylene Blue.—Continues to show ash in excess of U.S.P. limit of 0.008 Gm. per 2 Gms. of sample. C. E. VANDERKLEED.

Has to be watched closely for zinc. Many lots contain it. W. L. SCOVILLE.

Mustard.—Several peculiar forms of mustard, both yellow and brown, have come to us this year. One was straight Brassica juncea and another a yellow seeded variety of the same. Another was Brassica cernua. All mustard imported has undergone a very remarkable improvement as to cleanliness and freedom from weed seeds. H. H. RUSBY.

Myrrh.—Considerable difficulty has been experienced with myrrh, several lots of which have contained many dark, soft and sticky pieces, of peculiar, intense, bitter taste. It has been successfully maintained that this is genuine myrrh. If so, the U.S.P. description should be so changed as to include them. H. H. RUSBY.

Nitroglycerin Tablets.—1-50 gr., 89.3 percent of standard strength, 93.3 percent, 103 percent, 100 percent; 1-100 gr., 99.73 percent of standard strength, 100 percent, 83.3 percent, 100 percent; 1-100 gr., 106.6 percent of standard strength, 103 percent. E. L. PATCH.

Nux Vomica.—Seven lots. Highest, 1.328 percent. Lowest, 0.705 percent. Average, 1.013 percent. Standard, 1.25 percent strychnine. C. E. VANDERKLEED.

1.175 percent, 1.195 percent, 1.1155 percent, 1.155 percent, 1.23 percent.

E. L. PATCH.

The difficulty of obtaining supplies of nux vomica has been the cause of the importation of considerable quantities of ignatia, probably for the extraction of strychnine.

H. H. RUSBY.

OILS.

Oil Benzaldehyde.—Contaminated with chlorine products.

Oil Cinnamon Leaf.—Substituted for oil Ceylon cinnamon.

Oil Turpentine.—Adulterated with mineral oils.

Oil Cottonseed.—Adulterated with corn oil and sunflower oils.

Oil Sandalwood.—Substituted by mixture of oil of Amyris and oil copaiba.

Oils of Lavender, Juniper Berries and Red Thyme.—Not of U.S.P. quality.

DEPT. AGRIC.

Oils Volatile.—The oils distilled in this country have given no trouble, but the difficulties of importation have led to some attempts at adulteration. The mixing of natural and synthetic products seems to have increased and some oils are difficult to obtain of satisfactory quality. Oil rose, oil rose geranium, oil eucalyptus and oil neroli are instances of oils difficult to obtain of satisfactory quality. Oils of lemon and orange differ as usual, particularly the terpeneless oils. Oils of bitter almond, lavender, eucalyptus, savin and sandalwood require careful watching, not only for chemical vagaries, but for physical results. Artificial and synthetic oils vary much more than before the war and are difficult to secure of satisfactory quality.

W. L. SCOVILLE.

Oil Anise.—Two lots were *nil* in optical rotation but answered all other U.S.P. requirements. U.S.P. requires lævogyrate rotation. C. E. VANDERKLEED.

Oil of Birch.—Twenty-two packages consisted in whole or part of methyl salicylate.

DEPT. AGRIC.

Oil Lemon.—Six lots tested; 3.52 percent, 3.56 percent, 3.63 percent, 4.08 percent, 4.18 percent and 4.32 percent citral by the method of J. C. Umney in Perfume anl Essential Oil Record, 1913, 4-269.

Oil Lemon, Extra Strong.—There is no declared citral content on this product and it varies accordingly. Two lots gave 12.55 percent and 21.5 percent by method of J. C. Umney.

C. E. VANDERKLEED.

Oil Mineral.

	Specific gravity
Odorless, tasteless, colorless	0.847 at 25° C.
Odorless, tasteless, fluorescent	0.854 at 25° C.
Odorless, foreign taste, fluorescent	0.853 at 25° C.
Odorless, tasteless, yellowish	0.867 at 25° C.
Odorless, tasteless, colorless	0.837 at 25° C.
Odorless, tasteless, colorless	0.853 at 25° C.
Odorless, fluorescent, tasteless	0.856 at 25° C.
Odorless, fluorescent, tasteless	0.860 at 25° C.
Odorless, colorless, tasteless	0.857 at 25° C.
Odorless, colorless, tasteless	0.877 at 25° C.
Odorless, colorless, tasteless	0.880 at 25° C.
Odorless, colorless, tasteless	0.849 at 25° C.

Several samples gave dark color with sulphuric acid test. E. L. PATCH.

The Russian variety being practically unobtainable, recourse must be had to oil from other sources. These oils are difficult to obtain free from kerosene taste and fluorescence and are much lower in specific gravity than is desirable. C. E. VANDERKLEED.

The disappearance of the Russian oil from the market caused much trouble for a time, but the conditions now are met satisfactorily with American oils and the Russian oil is no longer missed. W. L. SCOVILLE.

Oil Wintergreen.—Three packages in whole or part, methyl salicylate. One, 75 percent methyl salicylate. DEPT. AGRIC.

Oil Wormseed.—One lot adulterated with 44 percent of a fixed oil. Oil wormseed ordinarily averages 1.5 percent of non-volatile residue. C. E. VANDERKLEED.

Opium Gum.—Nine lots. Highest, 12.35 percent. Lowest, 11.31 percent. Average, 11.74 percent. Standard, 9 percent crystallized morphine. C. E. VANDERKLEED.

Opium, Powdered.—Six lots. Highest, 12.58 percent. Lowest, 11.84. Average, 12.11 percent. Standard, 12 percent to 12.5 percent morphine. C. E. VANDERKLEED.

Opium Antidote in Capsules.—Prove to be 4 1-5 grains of opium assaying 11.74 percent morphine in each capsule. E. L. PATCH.

Origanum.—Great quantities of origanum for use as a condiment continue to arrive as thyme, the thymol taste being very strong. H. H. RUSBY.

Oxgall, Powdered.—All lots were free from starch, a decided improvement in this product. C. E. VANDERKLEED.

Papain.—Two lots inferior, no starch present but only half usual power. One other, 16.7 in neutral, 22.4 in alkaline solution, and one 18.6 and 24. E. L. PATCH.

Paw Paw Juice.—Of fourteen samples nine were below standard. Several of these contained starch. One sample was 135 percent of standard. W. L. SCOVILLE.

Pepsin.—Pepsins are said by Ernest Quant to be frequently contaminated with bacteria.

Potassium Binoxalate.—One Gm. usually requires 11.65 Cc. normal KOH solution to neutralize. One lot was weak. Three samples from different parts of the container required 8.2 Cc., 9 Cc., 9.8 Cc. E. L. PATCH.

Potassium Cyanide.—Contents so labeled tested for carbonate and contained 3.1 percent cyanide. E. L. PATCH.

Prescription Variation.—The following prescriptions were summarized, and while the data given show some variations, as a whole they were better than what has previously been shown with reference to compressed tablets on the market.

℞ No. 1—	No. of samples	Variation
Antipyrin, gr. ii		1.28 gr. to 2.17 gr. = — 36 percent to + 8 percent
Sodii salicylat., gr. v	16	4.49 gr. to 6.22 gr. = — 10 percent to + 20 percent
Make 10 such capsules.		
℞ No. 2—		
Antipyrin, gr. ii		1.9 gr. to 2.7 gr. = — 5 percent to + 35 percent
Sodii bicarb., gr. x	18	4.9 gr. to 10.2 gr. = — 50 percent
Make 10 such powders.		

℞ No. 3—

Phenacetine, gr. v		4.2 gr. to 5.46 gr.	= — 16 percent to + 11 percent
Salol, gr. v	20	3.81 gr. to 5.25 gr.	= — 24 percent to + 5 percent

Make 10 such capsules.

℞ No. 4—

Salol, gr. iii		2.17 gr. to 3.44 gr.	= — 27 percent to + 15 percent
Quininæ sulphat., gr. iii .	20	1.79 gr. to 3.56 gr.	= — 40 percent to + 18 percent

Make 10 such capsules.

℞ No. 5—

Acetphenetidini, gr. iii ..		1.5 gr. to 3.8 gr.	= — 50 percent to + 27 percent
Bismuth subnit., gr. iii ..	55		
Sodii bicarb., gr. x			

Make 10 such powders.

Prescription No. 1 showed two substitutions of acetanilide for antipyrin; under no conditions was this excusable. No. 5 likewise showed two substitutions of acetanilide for acetphenetidin and one for bismuth subnitrate, subcarbonate being used; in this prescription there is possibly some excuse for acetanilide being found, and if the prescription had called for a liquid in connection with the combination, the pharmacist would have been justified in using bismuth subcarbonate.

N. A. R. D. JOURNAL, 1915.

Prune Juice.—Specific gravity, 1.049. Extractive, 18 percent alcohol, 17.58 percent vol. 1 Cc. required 0.4 Cc. N/10 KOH.

Specific gravity, 1.087. Extractive, 26 percent alcohol, 13.26 percent vol. 1 Cc. required 0.9 Cc. N/10 KOH.

Specific gravity, 1.057. Extractive, 21 percent alcohol, 17.6 percent vol. 1 Cc. = 0.4 Cc. N/10 KOH.

Specific gravity, 1.049. Extractive, 19.3 percent alcohol, 18.58 percent 1 Cc. = .36 Cc. N/10 KOH.

Specific gravity, 1.057. Extractive, 20.5 percent alcohol, 18.58 percent 1 Cc. = .52 Cc. N/10 KOH. E. L. PATCH.

Quassia.—Ash, 2.2 percent; extractive, 6 percent; ash, 2.2 percent; extractive, 4 percent; ash, 2.8 percent; extractive, 6 percent; ash, 2.4 percent; extractive, 5.8 percent; ash, 3.0 percent; extractive, 3.3 percent; ash, 8.0 percent; extractive, 7.0 percent. E. L. PATCH.

Quebracho.—Two lots. Highest, 1.22 percent. Lowest, 0.95 percent. Average, 1.08 percent. Standard, 1 percent alkaloids. C. E. VANDERKLEED.

Quinine Alkaloid.—Extreme variation in water content. Nine lots gave 0. percent, 7.3 percent, 9.3 percent, 11.3 percent, 12.5 percent, 12.7 percent, 13 percent, 15.1 percent and 20 percent. The U.S.P. allows 14.3 percent. C. E. VANDERKLEED.

Quinine Pills.—

2 gr. gave 2.035 grains of Quinine Sulphate $7H_2O$.
2 gr. gave 2.077 grains of Quinine Sulphate $8H_2O$.
5 gr. gave 4.942 grains of Quinine Sulphate $7H_2O$.
5 gr. gave 5.044 grains of Quinine Sulphate $8H_2O$.
2 gr. gave 2.035 grains of Quinine Sulphate $7H_2O$.
2 gr. gave 2.075 grains of Quinine Sulphate $8H_2O$.
2 gr. gave 1.8 grains of Quinine Sulphate $7H_2O$.

E. L. PATCH.

Rose.—Several shipments of "rose petals" have been received which consisted of the entire bud with calyx attached. H. H. RUSBY.

Saffron.—Powdered stamens of crocus, and so labelled, among the interesting shipments of the year. H. H. RUSBY.

Santonica.—Many large shipments have arrived of a form of this drug that is most puzzling. It so closely resembles the genuine that it may well be regarded as a young form of it and its odor is exquisite. On assay it is found to contain less santonine, often very little and sometimes none. It is shorter, greener and often has a short piece of peduncle attached. It is much in need of investigation. H. H. RUSBY.

Sarsaparilla, Mexican.—Two shipments of Mexican sarsaparilla were of such a peculiar appearance as to suggest that they represented a different species of smilax.

H. H. RUSBY.

Soap.—Powdered castile soap has 1 percent to 6 percent moisture. Two lots only partly dissolved in hot alcohol and solidified on cooling. E. L. PATCH.

Sodium Bisulphite.—One lot assayed but 64 percent $NaHSO_3$.

Sodium Iodide.—One lot assayed 95.2 percent NaI, the low assay being due to moisture.

C. E. VANDERKLEED.

Sodium Phosphate Monobasic.—99 percent anhydrous. Triturated, 94.14 percent NaH_2PO_4 anhydrous. 108.27 percent of monohydrated. E. L. PATCH.

Sodium Salicylate.—Two lots assayed 97.2 percent and 98.4 percent instead of the U.S.P. 99.5 percent. C. E. VANDERKLEED.

Spirit Ammonia Aromatic.—Lots deficient in ammonia carbonate and in ammonia water. One lot, three times too much ammonia, showed that 28 percent instead of 10 percent had been used. N. A. R. D. JOURNAL.

Spirit Camphor.—2 percent, 30 percent, 40 percent, 43 percent, 80 percent, 82 percent of official. One lot, 33 percent alcohol. N. A. R. D. JOURNAL.

Stramonium Leaves.—One sample, 0.219 percent alkaloids. Standard, 0.25 percent.

C. E. VANDERKLEED.

Strontium Peroxide.—One lot assayed only 69.2 percent absolute SrO_2 which is below the 84.5 percent stated by the N. & N. R. for a good product. C. E. VANDERKLEED.

Strychnine Alkaloid.—One lot was dark colored and contained excess of brucine.

E. L. PATCH.

Tablets Below Standard.—Acetanilide, 1.86 gr. instead of 3 gr.; 2.46 gr. instead of 3 gr.; acetanilide, 1.847 gr. instead of 2.5 gr.; 2.563 gr. instead of 3½ gr.; caffeine, 0.47 gr. instead of 1 gr.; 0.22 gr. instead of 0.5 gr.; quinine sulph., 0.66 gr. instead of 3 gr.; phenacetin, 2.35 gr. instead of 3 gr.; sodium salicyl., 4.24 gr. instead of 5 gr.; salol, 1.94 gr. instead of 2.5 gr. morph. sulph., 0.0206 gr. instead of 0.0417 gr.; strych. sulph., 0.036 gr. instead of 0.025 gr.

DEPT. AGRIC.

Terra Alba.—The trade still differs as to what the composition of terra alba should be. Most of the lots examined were calcium sulphate, but one lot was clay, another clay with much calcium sulphate, and another clay with a little calcium sulphate.

C. E. VANDERKLEED.

Tragacanth.—The year has been characterized by a great deal of dark, dirty and inferior tragacanth. As I have before remarked, a tragacanth several shades darker than the U.S.P. makes a perfectly white powder, and its use should be permitted. A great deal of this year's shipment, however, has been of a grade quite unfit for any but technical uses. It is not at all unlikely that considerable of it, admitted for technical use, has been sold in powdered form for medicinal purposes. The sale of India gum as tragacanth has ceased, for the simple and sufficient reason that the India gum has become the more valuable of the two. This is because of its very extensive use for one of the most contemptible forms of adulteration, that of ice-cream. H. H. RUSBY.

Triticum.—Our market has received a good deal of rather inferior triticum. The U.S.P. requirement "deprived of its roots" is met by cutting each internode of the rhizome off close to the nodes, which bear short root fragments. These nodes are supposed to be rejected, but this year many of them have been offered for import. Probably they were intended for use in nostrums, of which this drug is a common ingredient. Some triticum with the nodes attached has been received and there have been several shipments, under the name triticum, of a totally different grass rhizome. H. H. RUSBY.

Veratrum.—One lot, 1.32 percent. Standard, 1 percent alkaloid.

C. E. VANDERKLEED.

Wormseed.—A great amount of spurious Levant wormseed, or santonica, has been offered. This variety has an agreeable lemon odor and is of a light green color. The heads are shorter and more rounded than the genuine and mostly have a short stem attached. The article contains very little santonin. H. H. RUSBY.

Zinc Oxide.—99 percent ZnO; 99 percent ZnO; 99.16 percent, 98.96 percent. One lot, 96.93 percent, contained lead. E. L. PATCH.

Considerable difficulty was experienced in securing a quality to meet the U.S.P. test for heavy metals. Most gave only a slight test, but were not U.S.P.

W. L. SCOVILLE.

COMMITTEE { EDGAR L. PATCH, LYMAN F. KEBLER, H. H. RUSBY

NOTE.—After the paper was printed, except the last sheet, a letter was received from C. E. Vanderkleed of the Committee, objecting to the statement in the last paragraph on the first page, in relation to keeping qualities of digitalis and to the reference to chemical and physiological tests. Aside from this, he approved the report. His letter follows:

July 20, 1915.

In reply to your letter of July 12th, containing preliminary sheets of the report of Committee on Drug Market, I beg to state that for the most part I approve of the report as outlined. I am not entirely in accord, however, with certain statements in the last paragraph on the first page.

I quite agree with the report that it is not practicable to guarantee the keeping qualities of all products. Neither can the manufacturer, be he large or small, regulate how preparations, prone to deterioration, are going to be kept after they leave his laboratory. So far, so good.

I am not in accord, however, with the references to the paper of Prof. Hatcher, who, basing his opinion on a relatively small number of drugs and preparations, concludes that digitalis does not deteriorate. In my own laboratory, having access to the records of tests of hundreds of samples, I am prepared to maintain that digitalis preparations *may* deteriorate, and often *do* deteriorate.

I do not question for one minute the results which Dr. Hatcher got with the preparations which he tested. It is entirely possible that he may have found a twenty-year-old sample that assayed better than a year-old sample. It is also even possible that he may have had a ten-year-old tincture testing as good as some freshly made.

We have records of many digitalis preparations, which, on re-examination after several months or years, show no deterioration. But, on the other hand, we have numerous instances where a considerable amount of deterioration did occur. Consequently, it is not safe to presume, because certain preparations did not deteriorate, that this drug and its preparations are not prone to deterioration.

I also object to the sentence reading as follows: "Then it is important to know whether the value of a product is determined by accurate chemical tests or inaccurate physiological experiment." The above sentence is certainly true when it comes to comparing really accurate chemical tests with really inaccurate physiological experiments. What I object to in the sentence is the implication that chemical tests are always accurate and physiological experiments always inaccurate. I have seen, and we have all seen, many chemical tests that fall far short of accurately portraying physiological activity, and we also know of many physiological determinations, such, for example, as those used for the standardization of adrenal preparations, which are far more accurate than any chemical test that has been devised.

It is, therefore, not merely a question of the accuracy or inaccuracy of the individual operator, but chemical tests may sometimes lead to wrong conclusions quite as well as physiological experiments. Take, for example, aconite preparations. On deterioration, a tincture of aconite may continue to show by chemical assay the full amount of required alkaloid, but on physiological test be found to be relatively inert. I would, therefore, suggest that this sentence be eliminated.

Please consider that this criticism of the report comes from one who is primarily a chemist, not a physiologist. Nevertheless, I do not deem it wise, in a report of this kind, to allow a discussion as to the relative merits of two different kinds of work, each absolutely essential to the standardization of drug products, to appear.

If these modifications can be made, I should be very glad indeed to have my name added to the report. Very truly yours,

(Signed) CHAS. E. VANDERKLEED.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

CHICAGO.

The April meeting of the Chicago Branch of the American Pharmaceutical Association was held Tuesday evening, April 25th, at Kuntz-Remmlers and was preceded by a dinner at which Dean Frederick J. Wulling of the University of Minnesota was the guest of honor.

Dr. J. H. Beal, of Urbana, presented the address of the evening, "The Pharmacist and the Law." The address was a remarkably clear and accurate presentation of present-day conditions regarding the host of restrictions and requirements that the law now throws upon the pharmacist. It pointed out also the indications of an avalanche of new laws within the coming year or so bearing many more most onerous and unjust limitations of the drug business. In conclusion, Dr. Beal pressed home the warning that the organized pharmacists of the country must watch and influence all legislation regarding pharmacy coming before our legislative bodies.

The address was most heartily received and indorsed, and motion was made that the publication committee of the parent association be requested to prepare reprints of it which could be sent to the officers and legislative committees of the state pharmaceutical organizations.

Dr. Wulling presented the greetings of the Northwestern Branch of Minneapolis and discussed the legislative outlook in Minnesota. He said the legislative committee was well organized, with one member from each legislative district, and was instructed, not only to watch carefully all bills brought before the legislature, but also to prepare an amendment to the pharmacy law requiring a college education in pharmacy as a prerequisite to the State Board examination.

Secretary H. C. Christensen, speaking for the National Association of Boards of Pharmacy, stated that, so far as he could learn, in about twenty-five states prerequisite legislation would be asked for.

In the business session of the Branch the deferred report of the committee on amendment of the declaration and by-laws was adopted with some modifications. The principal discussion arose over the point as to whether the Branch should continue to include in its membership all members of the parent association resident in or near Chicago, or whether only such American Pharmaceutical Association members as paid dues to the Branch should be included. It was decided to continue the former plan and look for financial support to the voluntary contributions of members of the Branch. Dr. Beal made the suggestion that the Association offer its Certificates of Membership to the Branch for sale to the members of the Branch, the returns from such sale to go into the treasury of the Branch.

Mr. Gray moved that our delegates (to be appointed at the May meeting) to the Atlantic City meeting be instructed to invite the Association to meet in Chicago in 1918, the twenty-fifth anniversary of its last meeting here. Professor Clark moved as an amendment that the Chicago Branch institute an active campaign to obtain the 1918 meeting for Chicago. Unanimously adopted with enthusiasm.

E. N. GATHERCOAL, *Secretary.*

CITY OF WASHINGTON.

The April meeting of the City of Washington Branch of the American Pharmaceutical Association was devoted to a discussion of the proposed Recipe Book, by M. I. Wilbert, and also the Appendix to the British Pharmaceutical Codex by Mr. Wilbert.

Mr. Wilbert pointed out that the idea was one of the many good ones that have been proposed by Mr. H. P. Hynson, and was intended originally as a guide solely for the purpose of having something that contained formulas that were not official, yet for which there was a certain demand. These formulas were to be more or less suggestive and intended for the purpose of establishing whether or not they had any value.

He further pointed out that the retail druggist had thus far failed to coöperate in the work and thereby had lost an opportunity. With such a book containing standard and harmless formulas for toilet preparations, cosmetics and household remedies, they would be in a position to recommend to the public something that had some value and at the same time safeguard the public health by warning them against the use of many preparations now on the market containing heavy metals, all of which were harmful. He also stated that, in this judgment, he believed that pharmacy legislation had had a downward influence on the pharmacist, for the reason that all were now placed on the same level; thus the disappearance of the former scientific pharmacist of standing in his community, who was looked up to for counsel and advice by the public. The public now believe that the license granted makes any holder thereof equal to the other fellow, and, as a result, we find that the majority of pharmacies are to-day small department stores or junk shops.

He pointed out the good work that had been done on the Appendix of the British Pharmaceutical Codex, and showed that many things could be found in this publication that under ordinary conditions could not be found without difficulty.

After considerable discussion, the meeting adjourned.

The next meeting of the Branch will be held at the Drug Farm of the Institute of Industrial Research, some time the latter part of May.

S. L. Hilton, *Secretary.*

NASHVILLE.

A joint meeting of the Nashville Branch American Pharmaceutical Association and the Nashville Drug Club was held Thursday afternoon, April 13th, in the Music Room of the Nashville Y. M. C. A.

D. J. Kuhn, President of the Nashville Drug Club, who has recently recovered from an operation for appendicitis, presided. An unusually large crowd was present to hear the address of Mr. J. M. Barrett, special representative of the National Association of Retail Druggists, on the subject of Legislation. Mr. Barrett proved to be a forceful speaker and held the attention of his audience for over an hour. He began by showing the need of organization in all lines of endeavor, and paid a glowing tribute to the great work being accomplished by the American Pharmaceutical Association, National Association of Retail Druggists, National Wholesale Druggists' Association and State Associations. He said many things can be accomplished by coöperation and concerted action that would utterly fail if attempted single handed. The passage of the Harrison Law was cited as being the result of united action of the drug trade.

He told of the splendid organization of druggists in Indiana, and of the many good things they have accomplished by pulling together. The public has an idea that druggists are making enormous profits and at every meeting of state and national legislative bodies numerous bills, harmful to the drug trade, are introduced, and it is only by vigilant and unrelenting efforts that they can be defeated. He believed in a thorough and systematic organization of all drug interests in the state, and outlined a plan whereby this could be accomplished, pledging his assistance in its perfection. From a business standpoint every druggist should realize that it is to his interest to take an active part in legislative affairs. If druggists do not look after legislation affecting them, others less capable will, to their sorrow.

The patent medicine question is one that he thinks will confront future legislators, and he urged the druggists to give it careful thought. He commented on the plan of organization of the Nashville Drug Club, which connects it with a collecting agency that looks after its finances; he stated that it was the best he had ever seen.

The U.S.P. and N.F. Propaganda was strongly endorsed, and every listener advised to give it his hearty support. Unanimous action was then taken endorsing his legislative plan.

President Kuhn thanked Mr. Barrett on behalf of the body for his splendid address. A motion was passed appointing S. C. Davis as delegate to the Central Health League of this city, after which the meeting adjourned.

William R. White, *Secretary.*

NEW YORK.

The April, 1916, meeting of the New York Branch of the American Pharmaceutical Association was called to order by President Lascoff at 8.30 o'clock, on the evening of the 10th.

The Minutes of the previous meeting were read by the Secretary and adopted.

The Treasurer presented his report, which was accepted with thanks.

Mr. McElhenie, Member of the Council, being absent, no report was rendered.

Chairman McCartney of the Membership Committee presented the names of the following gentlemen for membership in the parent association, and the Secretary was requested to forward them to the General Secretary: Julius Kramer, 723 Ninth Avenue, New York; Robert C. Purcell, 280 Pearl St., New York; Zachary Joshua Loussac, 107 Front St., Juneau, Alaska; Eugene James Cardarelli, 99 Wilson St., Brooklyn, New York; Lewis Nathan Brown, 115 West 68th St., New York; Lucius P. Brown, 137 Davis Avenue, W. New Brighton, S. I.

For membership in the New York Branch, Mr. McCartney presented the following: Pierre Arnold Bernard, P. O. Box 45, New York; Carl Paul Schlicke, 440 Washington St., New York, N. Y.; Morris Kantor, 184th St. and Audubon Avenue, New York.

Dr. Anderson, reporting for the Committee on Legislation and Education, advised the members present that action on the Stevens Bill is pending. Dr. Anderson reported further that the bill introduced in the New York Legislature, increasing the preliminary education of pharmacy students to 30 counts, is so worded that it will exclude from the licensing examinations all applicants who did not have, at the commencement of their pharmacy course, 30 Regents' counts, and would therefore militate against those entering upon the study of pharmacy prior to the new requirements, who might not come up for examination before the State Board until after 1916.

Dr. Anderson's report was received with the thanks of the members.

For the Committee on Fraternal Relations, Dr. Diner, Chairman, reported progress.

Dr. Diekman submitted a voluminous report on the progress of pharmacy and new remedies. This report was discussed by Drs. Raubenheimer, Weinstein, and Diner, and was accepted with thanks.

The gentleman proposed for membership in the Branch (Messrs. Bernard, Schlicke and Kantor) were then elected.

Mr. Leo Roon presented an interesting paper on "The Physical Significance of Emulsions."

In the discussion which followed, Dr. Wimmer expressed his satisfaction that the writer is applying his studies to the physical side of pharmaceutical preparations, Dr. Arny amplifying and emphasizing Dr. Wimmer's remarks. A further general discussion of Mr. Roon's paper followed, in which Drs. Diekman, Diner, Weinstein, Schaefer, Raubenheimer, Lascoff, Mayer, Fried and Turner joined.

After Mr. Roon had answered questions and replied to criticisms, he was extended a vote of thanks by the members present.

Due to the lateness of the hour, Dr. Novack's paper on the "Physical Phenomena Pertaining to Solution and Crystallization" was not presented. It was voted that this be postponed to some future meeting.

Dr. Raubenheimer introduced a resolution on behalf of the importation into the United States of medicines, which is being seriously interfered with by the belligerent nations. This resolution was adopted by the Branch.

PROFESSOR RAUBENHEIMER'S RESOLUTION.

WHEREAS the importation of medicines into the United States has been seriously interfered with by the belligerent nations, and in the majority of cases has been entirely stopped,

WHEREAS the suffering public in the United States is thereby deprived of much needed remedies for the cure and relief of disease,

WHEREAS the importation of medicinal substances to neutral countries should not be interfered with by the nations at war, provided that satisfactory guarantee be given that such supplies are not resold to belligerent countries,

Be it resolved, unanimously, at the regular meeting, April 10, 1916, of the New York Branch of the American Pharmaceutical Association, consisting of over —— members, all citizens of the United States, that the Hon. Robert S. Lansing, Secretary of State, is earnestly requested to take immediate steps to remedy these deplorable conditions, so that the suffering humanity in our country can be supplied with much needed imported medicines, not manufactured in the United States.

Mrs. Gay's suggestion with reference to publicity was referred to the New York Pharmaceutical Conference.

There being no further business to come before the meeting, an adjournment was taken, subject to the call of the chair.

JEANNOT HOSTMANN, *Secretary.*

NORTHWESTERN.

The Spring meeting of the Northwestern Branch of the American Pharmaceutical Association was held at the College of Pharmacy, University of Minnesota, April 18th. A brief business session preceded the program, which was as follows:

1. Demonstration on color photography, illustrated with views of medicinal plants in which the natural colors had been reproduced, by E. L. Newcomb.

2. Report on Publicity Work of the Minnesota State Pharmaceutical Association, by E. L. Newcomb.

3. Excursion through the McLaughlin-Gormley-King Drug Milling Plant.

Secretary Newcomb first presented the report of the Publicity Committee and then proceeded with the demonstration on color photography. The principle involved in the making of Lumière and other color process plates was briefly explained, and then views representing medicinal plants, which had been grown at the College of Pharmacy, were reproduced upon the screen. A number of views taken at Como Park were also shown. Among the medicinal plants illustrated, the following were particularly attractive and the coloring quite accurately reproduced: Hyoscyamus, cypripedium, digitalis, skunk cabbage, insect flowers, comfrey flowers, flowers of datura species, delphinium, and roses. Dr. Newcomb stated that much of the work in connection with the preparation of the slides had been done by Mr. Henry Morris, of the photographic department of the University.

Following the papers those in attendance walked in a body to the drug milling plant and, under the guidance of Mr. G. A. N. King and Dr. Eugene Friedmann, were shown through one of the most completely equipped drug milling plants in the country. Among other drugs, the grinding of which was inspected, the following proved of special interest: gentian, fœnugreek, licorice, nux vomica, myristica, cinnamon and hepatica.

Much interest was manifested by the members in the warehouse, where tons of crude drugs of all kinds were on display.

E. L. NEWCOMB, *Secretary.*

PHILADELPHIA.

The regular monthly meeting of the Philadelphia Branch of the A. Ph. A. was held in joint session with the Philadelphia County Medical Society at the College of Physicians and Surgeons, Wednesday evening, April 26th.

Owing to the unusual conditions, all business was dispensed with, and the entire evening devoted to the following papers:

Dr. Robert P. Fischelis: "How Physicians and Pharmacists Can Coöperate in the Use of Available Drugs."

Dr. John R. Minehart: "What Should Be Done To Help Solve the Drug Problem?"

Mr. George M. Beringer: "The U. S. Pharmacopœia, the National Safeguard Against Adulteration."

The papers were formally discussed by Dr. S. Solis Cohen, Dr. Horatio C. Wood. Jr., Prof. Charles H. LaWall, Mr. Ambrose Hunsberger, and Dr. Franklin M. Apple.

During his discussion of the papers, Prof. Remington announced, officially, that the U.S.P. IX would make its appearance September 1, 1916.

J. ED. BREWER, *Secretary.*

SAN FRANCISCO.

The San Francisco Branch of the American Pharmaceutical Association met on Thursday evening, April 13, 1916, in the office of the Pacific Pharmacist. President Lengfeld presided. The minutes of the March meeting were read and approved. The Publicity Committee reported that plans were about completed for the open meeting on Friday evening, May 5, 1916, in Assembly Hall, 246 Pacific Building. Captain Wayne H. Crum, Medical Corps, U. S. Army, will speak on "Pharmacy and National Preparedness." Communications from the Midland Druggist and Pharmaceutical Review and from the Stirring Rod were received.

Dr. A. S. Musante, Dr. Zieg and Dr. J. H. Dawson were appointed a committee on Conventions and Pharmaceutical Gatherings. Mrs. R. E. White, Mr. C. M. Twining and Mr. J. L. Lengfeld will constitute a committee on Drug Market.

Mr. C. M. Twining demonstrated the making of a bacterial vaccine. The sealed collecting tube, containing pus from an abscess, as it is sent in by the physician, was shown, then the platinum wire by which the pus is transferred from this container to culture media on which the bacteria are grown, the method of streaking out the pus on blood-

agar culture media to grow the bacteria in separate colonies to get the pure culture, the pure cultures planted on individual tubes ready to be washed off with salt solution, the sterile suspension of bacteria in a hermetically sealed tube in which it is stored, a concentrated mixed vaccine made up of nearly one hundred strains of the particular bacterium exhibited (B. Coli), sterile and ready to be diluted to make the resulting vaccine to any count desired by the physician, a package of finished vaccine in specially made small bottles ready for use. At four steps during the process, to insure absolute safety, the vaccine is tested for sterility by means of a Hall tube. This tube is so built that aërobic and anaërobic growths are obtained in the same tube. Mr. Twining was formally thanked by the members for his interesting talk.

The informal discussion of the evening was the manufacture of chemicals in the pharmacist's laboratory. It was shown that many chemicals, of which there may be an excess stock, could easily be converted into some expensive, much-needed articles. Examples given were the manufacture of white precipitate from mercuric chloride, thymol diiodide from thymol, and bismuth sub-nitrate from bismuth oxychloride. A useful, inexpensive and easily made drying apparatus was shown.

President Lengfeld explained his system of prescription records.

It was decided to offer a membership prize in the American Pharmaceutical Association to the student of the graduating class of the California College of Pharmacy who stands highest in Theory and Practice of Pharmacy, and who, in the estimation of the Professor of this branch, will be most appreciative of such honor.

The Treasurer reported a balance of $25.25. The members adjourned to meet on Friday evening, May 5, 1916, 246 Pacific Building, Fourth and Market Streets.

CLARISSA M. ROEHR, *Secretary.*

ST. LOUIS.

Dr. James H. Beal lectured before the St. Louis Branch of the A. Ph. A. on "The Burdens Imposed by Reformatory Legislation," March 17th. The auditorium was filled with an audience representing the various branches of pharmacy.

Dr. Beal commented on the disagreeable features of modern reformatory legislation, and emphasized the burdens put upon law-abiding citizens who are in no way responsible for the abuses that the laws are intended to eradicate. He was willing to accept with resignation a certain amount of penalizing of the innocent in order to punish the guilty, but contended that the modern tendency is to forget the innocent in a rather fruitless effort to catch the guilty. Dr. Beal emphasized the fact that many substances and articles are extremely useful when properly employed and correspondingly harmful when wrongfully handled. He pointed out that sharp-edged tools are potent agents of harm, but legislators recognize their practical value and do not unnecessarily hamper legitimate uses even though murders are committed with axes and persons are killed with butcher knives. The speaker laid stress on the tendency of modern times to apply special rules when it comes to transactions that pertain to the drug trade. The amount of inconvenience and expense thrust upon pharmacists is of no moment in the work of legislators who are anxious to place restrictions about the sale and use of medicines of great therapeutic value, and of possible misuse. He reviewed the alcohol question as it affects pharmacy and medicine. He cited the workings of state prohibition laws and the burdens placed on law-abiding citizens in order to reach the few who abuse their privilege of citizenship. He said, "Why should thousands of respectable druggists be subject to this restraint upon their business because a few persons have conducted saloons disguised as drug stores?" The habit-forming drug problem came in for extended consideration and a comparison was made between practical reformers and those who will be satisfied with nothing but absolute theoretical perfection. Dr. Beal gave emphasis to the beneficial effects already derived from the Harrison Anti-Narcotic Law and pleaded for a further and fair trial before law-makers dived into additional tinkering. Particularly lucid was Dr. Beal's discussion of the middle ground between total prohibition and unrestricted sale.

The audience was one which quickly realized that the evils and burdens described by Dr. Beal were not imaginary. From the pharmacy apprentice to the proprietor, manufacturer and jobber, the discussion appealed in a practical manner. He urged those present to enter upon a program of preparedness and see that new drug laws are not rushed through without giving the drug trade an opportunity to "stop, look and listen."

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 19.

PHILADELPHIA, PA., March 8, 1916.

To the Members of the Council:

GENTLEMEN:

Motions No. 34 (*Adoption of Proposed Resolution on Use of Text of National Formulary*), *No.* 35 (*Appropriation to Committee on Recipe Book*), *No.* 36 (*Time of Sixty-fourth Annual Meeting*), *No.* 37 (*Approval of Tentative Program for Sixty-fourth Annual Meeting*), and *No.* 38 (*Election of Members*); *applications Nos.* 73 *to* 100 *inclusive* have each received a majority of affirmative votes.

The following communication has been received by the Secretary of the Council from C. F. Nixon of Committee on Recipe Book:

"When your letter of September 6, 1915, arrived stating that I had been elected a member of the Committee on Recipe Book, I was pleased with the appointment, and replied that I would accept and try to perform the necessary duties. I was pleased, as I have always been interested in that kind of work, and appreciate the appointment.

"I have just received a letter from Chairman Raubenheimer, to the effect that work would begin at once. I am sorry to say that my health has not been good for a year or two, and I have been trying to drop some of my activities. In the meantime duties have come up that I must attend to, and I do not feel that I can take up the work that will be necessary in connection with this Committee. It is with real regret that I feel obliged to resign my position on the Committee, and am sorry that I did not do so in the first place. I did not at the time, as I hoped that I might be able to carry out my part of the duties. Will you please, therefore, accept my resignation?"

Mr. Nixon's term expires in 1916.

Mr. Nixon suggests William H. Glover, of 299 Essex Street, Lawrence, Mass., as his successor, as does also Otto Raubenheimer, Chairman of the Committee on Recipe Book, the latter stating that "Mr. Glover has contributed a number of papers to the A. PH. A. containing formulas and I am sure he will make good."

Motion No. 39 (*Acceptance of Resignation of C. F. Nixon as a member of the Committee on Recipe Book and election of W. H. Glover as his successor*). Moved by Dr. F. E. Stewart, seconded by C. H. La Wall, that the resignation of C. F. Nixon as a member of the Committee on Recipe Book be accepted, and that W. H. Glover be elected to succeed him.

The following communication has been received:

To the Members of the Council of the
American Pharmaceutical Association:

GENTLEMEN:

The Committee on Publication submits the following report:

To the Members of the Council:

GENTLEMEN:

Prof. E. G. Eberle assumed the duties of Editor of the JOURNAL on April 6, 1915, and conducted his work from Dallas, Texas, visiting the Publication Office at Columbus, Ohio, from time to time, and returning. Such a condition was recognized as temporary only, and at the San Francisco meeting, the Committee on Publication asked that the question of publication office be determined by the Association. After this question had been deliberated over and thoroughly discussed, the selection of the office of the JOURNAL was referred to the Editor and the Committee on Publication with power to act.

The Committee duly advertised for bids for the printing of the JOURNAL for 1916 and the firm of J. B. Lippincott Company of Philadelphia, being the lowest bidders, were awarded the contract.

The Philadelphia Drug Exchange very generously offered the use of its rooms in the Philadelphia Bourse Building, free of charge, as the office of the JOURNAL. Acting under the authority given at the San Francisco meeting of the Association, the Committee on Publication decided to accept this generous offer of the Philadelphia Drug Exchange and unanimously decided to establish the office of publication of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in Philadelphia as its central office.

The Committee on Publication asks the Council to appropriate the sum of $100.00 to pay the travelling expenses of Editor Eberle in coming from Dallas, Texas, to Columbus,

in December, 1915, and then to Philadelphia.

Editor Eberle has very strenuously insisted on personally paying the travelling expenses of himself from Dallas, Texas, to Columbus and return on the several trips that he made as Editor from April, 1915, to December, 1915. The Committee on Publication feels that this unselfish action and the devotion of our Editor to the interests of the Association should be made known to the members of the Council and we desire to express, as a Committee, our appreciation of his kindly offers and sincere efforts in behalf of the JOURNAL.

The JOURNAL office is now established in the new quarters, which offers every convenience and facility for work, and it is believed that this has been another forward step in the conduct of the JOURNAL and the history of the Association.

Very truly yours,

J. W. ENGLAND,
Chairman.

March 1, 1916.

The above appropriation is approved by the Committee on Finance.

Motion No. 40 (*Appropriation to Editor Eberle for Travelling Expenses*). Moved by G. M. Beringer, seconded by C. H. La Wall, that an appropriation of one hundred dollars be made to pay the travelling expenses of Editor Eberle in coming from Dallas, Texas, to Columbus, Ohio, in December, 1915, and then to the Philadelphia office of the JOURNAL.

Motion No. 41 (*Election of Members*). You are requested to vote on the following applications for membership:

No. 101. Amanda Stahl Druehl, 623 Alaska St., Chicago, Ill., rec. by Herman Fry and Jean Gordon.

No. 102. Charles E. Hires, 206 S. 24th St., Phila., Pa., rec. by E. G. Eberle and J. W. England.

No. 103. Karl Francis Ehmann, 2020 Montgomery Ave., Phila., Pa., rec. by W. Robert Decker and Charles H. La Wall.

No. 104. Arthur A. Lee, Hospital Steward, U. S. N., U. S. Naval Training Station, San Francisco, Cal., rec. by Wm. B. Day and J. F. Rupert.

No. 105. Lucy Ann Loechtenfeldt, 727 Mt. Hope Road, Cincinnati, Ohio, rec. by Wilhelmina Fennel and Bertha Ott.

No. 106. Carl William Seitz, U. S. S. Oregon, San Francisco, Cal., rec. by Wm. B. Day and J. F. Rupert.

No. 107. Aime Joseph Lachapelle, 79th Ave. A., Turners Falls, Mass., rec. by Theodore J. Bradley and John G. Godding.

No. 108. Chanon A. Bernstein, 3136 Broadway, New York, N. Y., rec. by St. Claire Ransford-Gay and Frank L. McCartney.

No. 109. Henry Pollock, 649 Prospect St., E., Cleveland, Ohio, rec. by Eugene R. Selzer and Wm. B. Day.

No. 110. Lawrence N. Upjohn, M.D., 48 Vesey St., New York, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 111. George Simon, 135 William St., New York, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 112. Harry A. Stebbins, 145 Front St., New York, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 113. Edward Zink, 203 Fulton St., New York, N. C., rec. by Turner F. Currens and Frank L. McCartney.

No. 114. Dwight T. Scott, care of National Vaccine Co., Washington, D. C., rec. by Turner F. Currens and Frank L. McCartney.

No. 115. Clarence E. Wright, 435 W. 119th St., New York, N. Y., rec. by Ezra J. Kennedy and Frank L. McCartney.

No. 116. N. C. Partos, 160 Second Ave., New York, N. Y., rec. by Frank L. McCartney and George T. Riefflin.

No. 117. Alirio Diaz Guerra, M.D., 29 Polhemus Place, Brooklyn, N. Y., rec. by Frank L. McCartney and Turner F. Currens.

No. 118. Nestor Petillo, 57–59 Perry St., New York, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 119. Adolph Wolf Lerner, 556 Quincy St., Brooklyn, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 120. Franklin Black, 81 Maiden Lane, New York, N. Y., rec. by Turner F. Currens and Frank L. McCartney.

No. 121. Oscar Paul Mallard, Box 31, Llanerch, Pa., rec. by Charles H. La Wall and Joseph P. Remington.

No. 122. Leland A. Johnson, 4809 N. 24th St., Omaha, Neb., rec. by Howard C. Newton and I. Curtis Arledge.

J. W. ENGLAND,
Secretary of the Council.

415 N. 33rd St., Philadelphia, Pa.

A. PH. A. COUNCIL LETTER NO. 20.

PHILADELPHIA, PA., March 18, 1916.

To the Members of the Council:

Motions No. 39 (*Acceptance of Resignation of C. F. Nixon as a member of the Committee on Recipe Book and election of W. H. Glover as his successor*), *No.* 40 (*Appropriation to Editor Eberle for Travelling Expenses*) and *No.* 41 (*Election of Members; Applications Nos.* 101 *to* 122 *inclusive*) have each received a majority of affirmative votes.

The following communication has been received (March 11) from Alex. F. Peterson, of Missoula, Montana:

Members of the Council, American Pharmaceutical Association:

GENTLEMEN:

Earnestly desiring to advance the science and art of Pharmacy and to improve the condition of pharmaceutical practice in Montana:

By stimulating research and the development of improved methods;

By diffusing scientific-technical knowledge;

By fostering sound pharmaceutical education;

By upholding the dignity of pharmacy and demonstrating to the public its importance, and the necessity, as a matter of public safety, of restricting pharmaceutical service to trained pharmacists;

By extending the field of usefulness of the pharmacist to the people;

By promoting the enforcement of due observance of established standards for the identity, purity, and strength of medicines;

By furthering the suppression of empiricism;

By aiding in the regulation of the use of dangerous and habit-forming drugs and in the protection of the public health;

By maintaining respect for ethical standards in the practice of pharmacy:

By promoting relations of comity and mutual respect between physicians and pharmacists; and in short, in all proper ways, to promote the true welfare of pharmacy and pharmacists.

We, the undersigned, realizing the importance and full significance of affiliation with the national organization, do petition the Council of the American Pharmaceutical Association to grant us permission to establish a branch of the Association in Montana, with headquarters at the School of Pharmacy of the University of Montana, Missoula, and be it further understood, that each person hereupon attaching his signature, promises to give his hearty support to the branch and to the National Association and to aid in conducting the branch in accordance with the rules and regulations of the American Pharmaceutical Association:

We, the undersigned members of the A. Ph. A. concur in the organization of a Montana Branch of the A. Ph. A., and pledge our support to help make the branch a success, and to build up the prestige and membership of the parent association, it being understood that the aims and objects of the branch association are the same as those outlined in the Constitution and By-laws of the A. Ph. A.

Louis Dreibelbis, Butte,
W. R. Montgomery, Butte,
Howard Rockefeller, Butte,
J. L. Kraker, Bozeman,
F. A. Schreiber, Livingston,
W. P. Porter, Belgrade,
Charles J. Chapple, Billings,
Fred A. Woehner, Great Falls,
R. L. Connell, Miles City,
H. H. Bateman, Missoula,
Sid J. Coffee, Missoula,
Alex. F. Peterson, Missoula,
Charles E. Mollet, Missoula,
C. P. Valentine,
D. H. Hauptman.

Do you favor granting the above petition? It will be known as *Motion No.* 42 (*Petition to form the Montana Branch, A. Ph. A.*).

J. A. Koch writes: "The appropriation for printing, postage and stationery for 1915 has been overdrawn, and at the request of Treasurer Whelpley, I wish to make a motion that an appropriation of $143.98 be made to cover overdraft for printing, postage and stationery for the year 1915."

The appropriation is approved by the Committee on Finance.

Do you favor the above motion? It will be known as *Motion No.* 43 (*Additional Appropriation of* $143.98 *for Printing, Postage and Stationery for* 1915).

J. W. ENGLAND,
Secretary of the Council.

415 N. 33rd St., Philadelphia, Pa.

EDITORIAL NOTES

Editor: E. G. EBERLE, Bourse Building, Philadelphia, Pa.

Committee on Publication: J. W. ENGLAND, *Chairman;* G. M. BERINGER, E. FULLERTON COOK, H. B. MASON, F. J. WULLING, and the Editor-in-Chief of the Journal, General Secretary, Treasurer and Reporter on the Progress of Pharmacy, *ex-officio.*

Office of Publication, 253 Bourse Building, Philadelphia, Pa.

FRENCH FIELD LABORATORIES.

According to the Schweizer Apotheker Zeitung, the French, as a part of their "Pharmacie Militaire," have organized two hundred mobile field laboratories for analytical and toxicological work at the front. One of these is attached to each Army Corps.

Each laboratory superintends the sanitation of the troops of its corps; to examine, and if necessary, to disinfect all drinking water; and to ensure the wholesomeness and quality of all rations. Quite unexpectedly, also, it has had to investigate the methods of combating attacks of poison gas, lachrymatory shells, and other chemical methods of offence employed by the enemy. The disinfection of trenches and of clothes also comes under its duties.

The chiefs of these laboratories have been recruited, according to their qualifications, from pharmacists, expert chemists, doctors or licentiates of science, and others. Conferences have been organized, where these chiefs receive suggestions on various matters and indications of processes or methods to be employed. Each laboratory is supplied with cases of apparatus and reagents, as simple and handy, yet as complete as possible. This phase of the organization is still being discussed and modified.

The position of the chiefs is one of great responsibility and demands considerable freedom of action. They will rank as officers and will probably be subordinate only to the orders of the chief of their division. They will be mounted. The assistants in these laboratories will rank as subordinate officers, and will be mainly recruited from the assistant pharmacists who have not yet received a higher step, or from students of pharmacy who have fulfilled a part of their curriculum.

THE TERCENTENARY OF SHAKESPEARE'S DEATH.

Xrayzer II in Chemist and Druggist says: "I am not going to claim for our great poet that, if not a professed pharmacist, he had as much right to the title as many who have borne it, though other claims, quite as extravagant, have been made for him, and volumes have been written on his medical lore. He has been held up as peculiar among his contemporaries in that, whereas other writers of the time 'draw their illustrations from what was then thought the only fount of poetic description, the pagan mythology,' he 'has recourse to natural philosophy, astronomy, medical science, and English jurisprudence.' I say nothing of the other subjects, but, after a fairly comprehensive reading in the Elizabethan drama, I make bold to affirm that if Shakespeare differs at all from his most eminent rivals in the matter of 'medical science,' it is in showing comparatively little of it. Wootton says in his 'Chronicles' that most of the drugs and pharmaceutical preparations named by him would be familiar to anybody acquainted with the literature of his day, and the same might with equal truth be said of his medical lore in general."

A SCHOLARSHIP IN CHEMICAL ENGINEERING.

Dr. Victor G. Bloede, of Baltimore, has provided a scholarship for assisting deserving young men to obtain education in the field of industrial chemistry or chemical engineering. The Chemists' Club of New York has supervision of the endowment, and inquiries should be addressed to them before June 1st. Such acts are commended and should stimulate endowments for pharmaceutical research by assisting colleges and associations in such promotions.

UNITED STATES TO MAKE MEDICAL SURVEY.

Plans for a coöperative survey of the nation's medical and scientific resources to be used by the War and Navy Departments in war times have been discussed by President Wilson and committees from medical and

scientific organizations. The President approved the idea of an extensive investigation, saying that the information collected would be turned over to the military departments.

THE ENRICHT GASOLINE SUBSTITUTE.

The papers have given considerable space to the Enricht Gasoline Substitute. The fluid, perfected by the inventor, is supposed to decompose water into its constituents and the hydrogen made available at a very low price. One of the statements describes the liquid, capable of doing this, as of a greenish color, and when mixed in the proportion of four ounces to five gallons of water will produce motive power fully as powerful as gasoline.

Dr. C. F. Chandler gives his opinion in saying that the proposition is absolutely impossible, presenting the chemist's viewpoint. But now come the further reports that The Maxim Munitions Corporation has paid a large sum for the sole manufacturing rights.

THE SMITH-HUGHES BILL.

The Smith-Hughes Bill, now before Congress, provides for national grants for vocational education. Under its provisions, Federal grants are to be made to states for stimulating education in agriculture and in the trades and industries. The schools to be aided must be supported and controlled by the public; the instruction given in them must be of less than college grade; they must be designed to prepare boys and girls over 14 years of age for useful or profitable employment in agriculture, in the trades and industries and home economics.

Among the arguments advanced for the bill are the following: "An overwhelming public sentiment shows the need for vocational education in this country. The testimony in this behalf comes from every class of citizenship, from the educator, the manufacturer, the trades-unionist, the business man, the social worker, and the philanthropist.

"Vocational training is required to conserve and develop our national resources. These resources are decreasing. Successful competition with foreign countries in the future will depend upon our ability to 'sell more brains and less material.'"

BOOK NOTICES.

September, 1916, has been fixed as time when the United States Pharmacopœia IX and National Formulary IV will become official.

Digest of Comments on the Pharmacopœia of the United States of America and on the National Formulary for the Calendar Year Ending December 31, 1914. By Martin I. Wilbert. Bulletin No. 5, Hygienic Laboratory, 8vo, 508 pages. Washington, Government Printing Office.—A comment on this volume would be largely a repetition of the commendatory remarks made relative to previous issues. Like all of the preceding numbers, this volume contains much interesting matter; the object is kept well in mind and is replete with references to literature pertaining to pharmacy and materia medica. The completeness in this respect exhibits painstaking efforts, and while the references are of necessity brief, the abstracts give desired information relative to the scope and character of the original paper. It has been stated before that this work has been helpful to those charged with the revision of the Pharmacopœia and National Formulary, so the continuation of it will serve the next Committees, and also be welcomed by every pharmacist.

References are made to foreign pharmacopœias, the second supplement to the fourth edition of the Netherlands Pharmacopœia. The author concludes that, from a pharmaceutical point of view, the publication of the fifth edition of the British Pharmacopœia is the event of greatest importance to be recorded for the year 1914.

A point of special interest in connection with the appearance of this book is that it completes the adherence of the several powers signatory to the international treaty of 1906 for the unification of the pharmacopœial formulas for potent medicaments. This Pharmacopœia is also interesting in that the committee having the revision of the book in charge has endeavored to produce a British Pharmacopœia suitable for the whole Empire.

Semi-Annual Report on Essential Oils, Synthetic Perfumes, Etc. Published by Schimmel & Co. (Fritzsche Brothers, Miltitz, near Leipzig. London, New York. October, 1915.—These reports are always interesting and valuable, containing, as they do, authentic information relating to the scientific research

in the domain of essential oils. There is less statistical matter in this number, due to conditions in Europe, but otherwise the present report follows the plan of previous issues. The publication reviews the definitions and standards of the new pharmacopœias for essential oils, and presents the results of investigations conducted in their own laboratories and is replete with reports of other investigators in this particular field.

The Testing of Glass Volumetric Apparatus, Bureau of Standards (Circular No. 9).—This publication contains specifications and tolerances for glass volumetric apparatus, such as burettes, cylindrical graduates, flasks, pipettes, Babcock test bottles, and specific gravity flasks for Portland cement, and also a short description of methods of test of this apparatus. The circular is of value to manufacturers and users of volumetric apparatus, and those interested in the subject may obtain a copy free by addressing a request to the Bureau of Standards, Washington, D. C.

Legal Status of the Maintenance of Uniform Resale Prices, by Charles L. Miller, and published by the American Fair Trade League.

In this pamphlet no effort has been made to set forth the advantages of uniform resale prices to the producer, jobber, retailer and consumer, nor has the economic aspect of price maintenance been discussed. It presents a concise statement of the present legal status of the maintenance of uniform resale prices, as shown by the decisions of the federal and state courts. To this is added a brief statement of the foreign law. The decisions of the state courts are not discussed in detail.

The purpose of the American Fair Trade League in having this brief prepared was not to aid members engaged in litigation with the government or with private litigants; nor to show how to get around the law. The League's intention in distributing it is antithetical to any such purposes. It is to give the members the advantage of having all the decisions on the subject collected by one who has made a special study of the problems of price maintenance, so that traders may know just what the law is and avoid breaking it unintentionally.

Hygienic Laboratory, Bulletin No. 102: 1, Digitalis Standardization; the physiological evaluation of fat-free digitalis and commercial digitalin. By George B. Roth. 2, Preliminary Observations of Metabolism in Pellagra. By Andrew Hunter, Maurice H. Givens, and Robert C. Lewis.

Department of Chemistry, University of Illinois. History, equipment, members of the faculty, students and announcement of courses for the year 1916–1917. Contains a list of the alumni of the department of chemistry by classes from 1872 to 1915 inclusive.

"Studies from the Research Laboratory," Parke, Davis & Co., Detroit; Reprint No. 81, "The Filterability of Bacillus Bronchisepticus: with an Argument for a Uniform Method of Filtration," by N. S. Ferry, Ph.B., M.D.; and Reprint No. 82, "The Pineal Gland in Relation to Somatic, Sexual and Mental Development" (second paper).

SOCIETIES AND COLLEGES.

APPOINTMENTS ON COMMITTEES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AND SECTIONS.

Delegates to A. M. A. Section on Pharmacology, 1916: Joseph P. Remington, Chairman, Philadelphia, Pa. Henry H. Rusby, Newark, N. J. James H. Beal, Urbana, Ill. Martin I. Wilbert, Washington, D. C. Linwood A. Brown, Lexington, Ky. Elie H. LaPierre, Cambridge, Mass. Henry M. Whelpley, St. Louis, Mo. Reid Hund, Boston, Mass. Otto Raubenheimer, Brooklyn, N. Y. William B. Day, Chicago, Ill. Fred I. Lackenbach, San Francisco, Cal.

Delegates to the N. A. R. D., 1916: William C. Anderson, Chairman, Brooklyn, N. Y. Wilhelm Bodemann, Chicago, Ill. Lewis C. Hopp, Cleveland, Ohio.

Quality of Medicinal Products (Appointed by the Chairman of the Scientific Section): E. L. Patch, Chairman, Stoneham, Mass. Lyman F. Kebler, Washington, D. C. Henry H. Rusby, Newark, N. J. H. Engelhardt, Baltimore, Md.

Ebert Prize (Appointed by the Chairman of the Scientific Section): C. H. LaWall, Chairman, Philadelphia, Pa. Mrs. C. H. LaWall, Philadelphia, Pa. Robert P. Fischelis, Philadelphia, Pa.

Regulations for the Transportation of Drugs by Mail (Special Committee of the Section on Education and Legislation): Benj. L. Murray, Chairman, Rahway, N. J. Caswell A. Mayo, New York, N. Y. Henry P. Hynson, Baltimore, Md. James H. Beal, Urbana, Ill. John C. Wallace, New Castle, Pa. Martin I. Wilbert, Washington, D. C. C. W. Johnson, Seattle, Wash.

Survey of Teaching Institutions: Hugh Craig, Chairman, Chicago, Ill. J. H. Beal, Urbana, Ill. H. C. Christensen, Chicago, Ill.

THE ATLANTIC CITY MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

From indications which are interpreted to mean an unusually large attendance at the next annual meeting of the American Pharmaceutical Association at Atlantic City next September, the local Committee is planning for a record-breaker.

Reports coming into the office of the JOURNAL indicate that there will be delegations from Canada and Cuba, and even from the remoter portions of this country.

There is no place like Atlantic City, and its lure enthralls the hardened "globe-trotter" as well as the casual visitor. The headquarters for the meeting will be at the Chalfonte, one of the largest beach-front hotels, situated directly on the famous boardwalk. In addition to this there will be ample accommodations of a character to suit every taste and purse, from the most expensive and exclusive to the modest and comfortable smaller hotels at $2.00 per day and upwards.

On account of the first meeting of the Council convening on Labor Day, the local Committee suggests that the members of the Council arrange for reservations to cover their needs at a time considerably in advance of the meeting. This can be done by writing direct to the Hotel Chalfonte.

Atlantic City, during Labor Day week, is a very busy place, and hotel accommodations are not easy to obtain. It is particularly urged upon members to arrange for their quarters in advance. The headquarters of the Association will be Hotel Chalfonte, and the other hotels given in the list below are in close proximity to it. Should additional information be desired, it may be obtained by writing to The Bureau of Publicity, Atlantic City. The Bureau is prepared to furnish information about the hotels and rates, or any other matter pertaining to Atlantic City.

HOTELS.

Chalfonte, headquarters, one person in room, $4.00; two in room, $8.00; two in room with bath, $10. Haddon Hall, one person in room, $4, $5, $6, $7; one person in room, with bath, $9.00; two in room, $7, $8, $9, $10, $12, $14; two in room, with bath, $9, and up. Hotel Strand, two persons in room, $8 to $10; two persons in room, with bath, $12. Marlborough-Blenheim, one person, $6 per day, and up. Royal Palace, one person in room, $3.50 and $4; two persons in room, $7 and $8; one person in room, with bath, $5, $6, $7; two in room, with bath, $9, $10, $11, $12. Hotel Traymore, one person in room, $7, $8, $10, $11, $12; European plan, one person in room, $3, $4, $5, $7, $8, $9; two in room, $10 to $16; European plan, two in room, $5 to $10. Hotel Bothwell, $3 and $3.50 per day, running water. The Mullica, $2 and $3 per day; European plan, $1 per day. The Shoreham, $2 per day, two in room; $3 per day, with bath. The Grand Atlantic, $2.50 per day, two in room; $3 per day, single rooms. The Wiltshire, $3.50, $4, $5, $6, per day, single rooms; $2.50 to $5, two in room. The Seaside, $3.50 and $4, two in room.

Prices are American plan unless otherwise indicated.

The Local Committee has secured the Auditorium on the Steel Pier for the First General Session. This is only a short distance from the Chalfonte.

A handsome illustrated folder, published by the Atlantic City Publicity Bureau, will shortly be sent to the members. In the meantime, let every member resolve to combine pleasure and profit in a trip to the "Playground of the World" next September.

A BRANCH OF THE A. PH. A. FOR INDIANAPOLIS.

A meeting of the pharmacists of Indianapolis and vicinity was held April 10th for the purpose of organizing a Branch of the American Pharmaceutical Association.

There were thirty-five pharmacists present, and much enthusiasm prevailed, and the promises are excellent for an active Branch. Mr. F. A. Miller gave a very interesting and instructive talk on experimental work in growing medicinal plants.

The following have been chosen officers: President, Frank H. Carter, Indianapolis; vice-president, A. F. Sala, Winchester; secretary-treasurer, F. E. Bibbins, Indianapolis.

The members of the Executive Committee are: C. B. Jordan, Lafayette; August Kassulke, E. H. Niles, C. W. Watkins and A. D. Thorburn of Indianapolis.

MAY AND JUNE ASSOCIATION MEETINGS.

Arkansas Association of Pharmacists, at Little Rock, May 9–11. President, Booker Latimer, DeQueen; secretary, Miss Mary A. Fein, Little Rock.

Kansas Pharmaceutical Association, at Kansas City, May 16–18. President, W. J. Banks, Madison; secretary, C. Von Riesen, Marysville.

Louisiana Pharmaceutical Association, at Baton Rouge, May 16–17. President, F. A. Earhardt, New Orleans; secretary, J. T. Baltar, New Orleans.

Oklahoma Pharmaceutical Association, at Sulphur, May 16–18. President, W. S. Younkman, Tulsa; secretary, A. W. Woodmancy, Oklahoma City.

Texas Pharmaceutical Association, at Fort Worth, May 16–18. President, A. M. Fisher, San Antonio; secretary, W. H. Cousins, Dallas.

Manufacturing Perfumers' Association, at New York City, May 9–11. Secretary, W. J. Mueller, New York City.

Alabama Pharmaceutical Association, at Gadsden, June 21st. President, L. L. Scarborough, Anniston; secretary, W. E. Bingham, Tuscaloosa.

California Pharmaceutical Association, at Los Angeles, June 21–23. President, J. A. Sanford, Stockton; secretary, K. B. Bowerman, San Francisco.

Colorado Pharmaceutical Association, at Estes Park, June 20–23. President, H. B. SeCheverell, Denver; secretary, Charles J. Clayton, Denver.

Florida Pharmaceutical Association, at Tampa, June 21–22. President, M. M. Taylor, Tampa; secretary, J. H. Horton, Palatka.

Georgia Pharmaceutical Association, at Atlanta, June 6–7. President, S. E. Bayne, Macon; secretary, T. A. Cheatham, Macon.

Idaho Pharmaceutical Association, at Ketchum, June 19–21. President, W. F. Bee, Boise; secretary, D. S. Whitehead, Boise.

Illinois Pharmaceutical Association, at Springfield, June 6–8. President, Julius Riemenschneider, Chicago; secretary, W. B. Day, Chicago.

Indiana Pharmaceutical Association, at Indianapolis, June 20–22. President, Charles Genolin, Nashville; secretary, W. F. Werner, Indianapolis.

Iowa Pharmaceutical Association, at Iowa City, June 20–22. President, John Sutter, Burlington; secretary, Albert Falkenhainer, Algona.

Kentucky Pharmaceutical Association, at Olympia Springs, June 20–22. President, W. B. Tibbals, Somerset; secretary, J. W. Gayle, Frankfort.

Maine Pharmaceutical Association, at Augusta, June 28–30. President, D. T. Dougherty, Bath; secretary, M. L. Porter, Danforth.

Michigan Pharmaceutical Association, at Detroit, June 20–22. President, D. H. Jongejan, Grand Rapids; secretary, D. D. Allen, Fremont.

Mississippi Pharmaceutical Association, at Meridian, June 13–14. President, H. M. Faser, Oxford; secretary, Miss Flora Scarborough, Laurel.

Missouri Pharmaceutical Association, at Excelsior Springs, June 13–16. President, J. E. Koppenbrink, Higginsville; secretary, H. M. Whelpley, St. Louis.

Nebraska Pharmaceutical Association, at Hastings, June 15–16. President, K. L. Kreisinger, Fremont; secretary, J. G. McBride, University Place.

New Hampshire Pharmaceutical Association, at Newcastle, June 27–28. President, B. T. Porter, Ashland; secretary, Eugene Sullivan, Concord.

New York Pharmaceutical Association, at Richfield Springs, third week in June. President, A. S. Wardle, Hudson; secretary, E. S. Dawson, Syracuse.

North Carolina Pharmaceutical Association, at Wrightsville, June 20–22. President, E. L. Tarkenton, Wilson; secretary, J. G. Beard, Chapel Hill.

Pennsylvania Pharmaceutical Association, at Reading, June 20–22. President, T. Campbell, Philadelphia; secretary, D. J. Reese, Philadelphia.

Utah Pharmaceutical Association, at Logan, June 27–28. President, R. S. McAllister, Logu; secretary; C. VanDyke, Salt Lake City.

Vermont Pharmaceutical Association, at St. Albans, June 26–28. President, C. H. Skinner, Windsor; secretary, W. E. Terrill, Montpelier.

Virginia Pharmaceutical Association, at Mountain Lake, third Tuesday in June.

President J. F. Bauer, Richmond; secretary, E. L. Brandis, Richmond.

West Virginia Pharmaceutical Association, at Webster Springs, second week in June. President, B. E. Downs, Welch; secretary, C. H. Rogers, Morgantown.

Washington State Pharmaceutical Association, on board the Steamship Governor, during three-day cruise on Puget Sound, June 19–22. President, C. W. Johnson, Seattle; secretary, A. W. Linton, Seattle.

Flavoring Extract Manufacturers' Association, at Atlantic City, June 28–30.

National Association of Drug Clerks, at Chicago, June 1–3. Secretary, P. A. Mandabach, Chicago.

NEW YORK COUNTY PHARMACEUTICAL SOCIETY.

The New York County Pharmaceutical Society at its recent meeting elected the following officers: President, Bernard Colle; vice-president, Herman Walter; treasurer, Thomas Latham; financial secretary, Michael Halpern; recording secretary, A. Arthur Philo. After the meeting the Society held its sixth annual banquet and entertainment at Reisenweber's. Nearly two hundred members and their friends were present. Among those present, who made short addresses, were Caswell A. Mayo, Dr. William C. Anderson, Dr. Joseph Diner, Dr. J. Hostmann, Robert Lehman, Dr. Schreier, of the Yorkville Medical Society; Emil Roller, who presented the society with a photograph of the late Dr. Hermann Hager; Joseph Weinstein, and Joseph Weil.

The New York Branch of the American Pharmaceutical Association now has nearly two hundred members.

SPRING MEETING OF THE AMERICAN CHEMICAL SOCIETY.

The Fifty-second Meeting of the American Chemical Society was held at the University of Illinois, Urbana-Champaign, April 17th to 21st. The meeting was the largest to date, the total registration being 728 (570 members and 158 guests).

The regular opening session was held in the University Auditorium Tuesday morning. Professor W. A. Noyes introduced President Edmund Janes James, who welcomed the Society in the name of the University.

The meetings of the Divisions were held in the various lecture rooms of the Chemistry Building. All the Divisions offered programs of exceptional interest. The public lectures, given complimentary to the people of Urbana-Champaign by Professor Charles L. Parsons and Doctor Curtis F. Burnam, on the production of radium and its use in the treatment of cancer, were well attended. The lectures were well illustrated by specimens, models and moving pictures.

On Wednesday afternoon the new Chemistry Building of the University of Illinois was dedicated, the exercises being held in the auditorium.

THE MEDICO-CHIRURGICAL COLLEGE DEPARTMENT OF PHARMACY.

The senior class of the Medico-Chirurgical College Department of Pharmacy, faculty and friends were entertained by the Alumni Association, May 3rd, at the Adelphia. A musical program, interspersed with addresses, was rendered. The several departments of the institution were represented by speakers.

Light refreshments were served and terminated the delightful evening.

THE AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY ANNIVERSARY AND MEETING OF OHIO VALLEY DRUGGISTS' ASSOCIATION.

The American Druggists' Fire Insurance Company has prepared an elaborate program for its State agents' convention and anniversary meeting to be held in Cincinnati during the week of May 22nd. The topics for discussion include nearly every possible phase of retail drug store insurance and the proper adjustment of retail drug store fire losses. On May 25th the visitors will be entertained by the Ohio Valley Druggists' Association, the anniversary celebration closing in the evening with a banquet. A large number of representative men in pharmacy have been invited to be present on that occasion.

A COURSE IN PHYSIOLOGICAL ASSAY METHODS.

The Harvard Graduate School of Medicine has provided for a summer course in Physiological Assay Methods. The session will be held during the month of July, and this notice is given under the presumption that the information will be welcomed by some of the members of the American Pharmaceutical Association.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

Three hundred new members have been added to the Illinois Pharmaceutical Association as a result of the campaign carried on by the Membership Committee of the Illinois Pharmaceutical Association and Illinois Pharmaceutical Travelers' Association during the winter. Several committeemen have not yet reported, and it is expected that the list will be substantially increased by the time the associations meet in Springfield, June 6th, 7th, and 8th.

The interest shown by the druggists throughout the state and the large number who have joined the Association indicate a great awakening of enthusiasm in regard to the Association affairs and give promise of a big attendance at the coming convention. Over nine hundred members have already paid their dues for 1916, affording the largest income that the Association has ever enjoyed and providing the means for carrying on a vigorous legislative campaign next year, the plans for which will be fully discussed at the convention. This makes it imperative that every druggist in the State plan to attend this convention and take part in its important deliberations.

Among the speakers of note who will address the convention are Harry B. Mason, of Detroit, who will speak on "How to Make the Drug Store Pay Better," and Dr. J. H. Beal, who will discuss "Narcotic Legislation from the Retail Druggists' Standpoint."

The session of both associations will be held in the Illinois State Arsenal and a big feature will be the exhibit, as between forty-five and fifty manufacturers have engaged exhibit space and will display and dispense their products.

The Illinois Traction Company has made a special rate of one and one-third fare for the round trip on the coupon system, receipt to be taken on the going trip. The lines of this company afford excellent transportation to druggists residing in the central part of the State.

For the convenience of Chicago members, the Chicago and Alton will run a special train from Chicago, leaving the Union Station Tuesday morning, June 6th, at nine o'clock. An excellent dinner will be served on the train and every attention will be given to the comfort and pleasure of the travellers.

The entertainment committee of the Illinois Pharmaceutical Travelers' Association has arranged a very attractive program. The President's Reception and Annual Ball will be held on Tuesday evening, June 6th, at the Arsenal. Automobile rides around the city and special entertainment for the visiting ladies will be provided for Wednesday and Thursday by the Ladies' Auxiliary of the Sangamon County Retail Druggists' Association. Wednesday evening a banquet and entertainment will be given at the St. Nicholas Hotel for all who register at the convention. The Headquarters will be at the St. Nicholas Hotel and reservations should be made early, addressing communications to R. H. Smith, Chairman of the Hotel Committee, 160 N. 5th Ave., Chicago, Ill.

NEW YORK COLLEGE OF PHARMACY.

Since the purchase of a handsome showcase by the Library over a year ago, there has been an attempt to keep a collection of old books, illustrative of different phases of historical pharmacy, always on exhibition.

At present, attention is directed to two of the most celebrated antidotes to poisons and nostrums of the middle ages, Mithridatium and Theriaca (English Treacle).

No effort has been spared to make this exhibition a complete survey of the subject.

Mr. Horatio N. Fraser has loaned to the College, for exhibition purposes, four very old and beautifully-decorated stock jars. These are on display in the Library and are well worth a visit.

All interested are most cordially invited to the Library, which is open to visitors on week days from 10 A.M. to 1 P.M., and from 3 P.M. to 5 P.M., except Saturdays.

Upon invitation from the Chemical Society of the College of the City of New York, Professor Curt P. Wimmer delivered a lecture before that Society on "Our Present Knowledge of Alkaloidal Chemistry," on Thursday, April 6th.

Emeritus Professor Coblentz, on Wednesday evening, April 12th, delivered a lecture on "The Effect of the War on the Price of Chemicals" before the Pi Lambda Phi Fraternity at Havemeyer Hall.

ALUMNI ASSOCIATION OF THE UNIVERSITY OF ILLINOIS.

The annual business meeting of the Alumni Association of the University of Illinois and the election of officers was held at the School on Tuesday evening, March 21st. The fol-

lowing officers were elected: President, Leo L. Mrazek, '97; 1st vice-president, Herman Fry, '87; 2nd vice-president, Mrs. Anna Eicher, '09; 3rd vice-president, C. C. Orr, '14; Historian, Miss Charlotte Stimson, '00; Secretary, Treasurer, B. L. Eicher, '11.

The Treasurer's report showed a balance in the general fund of $714.32 and in the Alumni Ebert Fund of $633.68.

Arrangements for the annual banquet, which is to be held on Wednesday evening, April 26th, were discussed, and the Secretary was authorized to make arrangements for the banquet. Later, the Secretary announced that the banquet would be held in the Florentine room of the Congress Hotel.

Henry W. Colson presented a plan to adopt a uniform alumni and class pin to be used for the senior classes, as well as by the alumni of the school. A committee was appointed to select a suitable pin and to report to the Executive Committee before the opening of the next school year.

ALBANY COLLEGE OF PHARMACY.

The thirty-fifth commencement exercises of the Albany College of Pharmacy were held in the auditorium of the State Education Building, in Albany, Tuesday afternoon, April 25th. Dean Willis G. Tucker presided and degree of graduate of pharmacy was conferred upon forty-seven graduates by Dr. Charles Alexander Richmond, chancellor of the State University.

NORTHWESTERN UNIVERSITY.

The Alumni Association of Northwestern University School of Pharmacy gave a banquet on April 17th at Hotel Sherman, Chicago, in honor of the graduating class of 1916, who were the guests. The toastmaster was C. M. Turnquist, '96, and the speaker of the evening was James W. Morrisson, of the Morrisson-Fuller Co., who spoke on "Distribution and the Retail Drug Trade." Other speakers were Prof. R. H. Gault, of the department of Psychology and Liberal Arts; T. W. Rosenburg, president of the senior class; Dr. J. H. Long, dean of the school of history, and J. L. Clay, secretary and treasurer of the alumni association.

Prof. M. A. Miner, who has been connected with the School of Pharmacy for nearly thirty years, was presented with a "trip to California," the presentation speech being made by Dr. Harry Kahn.

CHICAGO COLLEGE OF PHARMACY.

The commencement exercises of the Chicago College of Pharmacy were held April 26th. The degree of Graduate in Pharmacy was given to thirty-nine; certificates were given to five special students and to thirteen members of the class of 1916, who lacked the required age or experience. The prizes were awarded as follows: Andrew Shearer prize, to Leo Ayres; Herman Fry prize, to Elmer Erickson; William Gray prize, to William Beckman; faculty prizes—pharmacy, to R. R. Weaver; materia medica and pharmacognosy, to R. L. Greenwood; chemistry, to F. W. Graham. The address to the graduates was delivered by Dean F. J. Wulling of the University of Minnesota school of pharmacy, his theme being "Character Building." Dr. David Kinley, vice-president of the University of Illinois, conferred the degrees, with a brief address in which a deal of practical advice for every-day druggists was embodied. In the evening of the same day the alumni association of the school tendered a banquet and reception to the members of the graduating class at the Congress Hotel.

THE PHARMACIST AND THE LAW.

EXAGGERATED STATEMENTS IN ADVERTISING FRAUDULENT.

The decision of the Supreme Court of the United States that advertisers are guilty of fraud if they exaggerate their wares in their advertisements is a notice of danger. It should make advertisers "stop and look and listen," lest their enemies hale them into court and call on them to prove the truth of their advertisement.

Human nature is not ignored in this decision. Mere puffing of wares, even if warmly done, is not forbidden so long as the seller does not assign qualities to the article that it does not possess. In other words, he must not try to deceive the buyer. An honest advertiser should have nothing to fear under this decision, unless he allows his imagination to run riot and gives assurances that, as understood by the buyer, go beyond the bounds of truth.

Advertisements that deceive the buyer will not be permitted in the United States mail, if recognized. So far as this shall prevent the exploiting of wild and worthless schemes, it is a decision to be welcomed. There is danger, however, that evil-disposed persons may see in it an opportunity to make trouble for honest advertisers, and, therefore, it may call for greater caution and restraint in advertising than sanguine and enterprising advertisers have heretofore found necessary.

OPPONENTS OF PRICE MAINTENANCE MEASURES THINK THERE WILL BE CONSIDERATION BY CONGRESS.

E. L. Howe, Executive Secretary of the National Retail Dry Goods Association, has made the statement that he had received definite information, from an entirely trustworthy source, to the effect that the price maintenance bills, now before Congress, were likely to receive early consideration. He gave it as his view that, unless the opponents of price maintenance took a stronger stand than they had yet done, one of the bills would probably become law.

GUARANTY LEGEND LABELS MAY BE USED UNTIL 1918.

As a matter of a hearing and investigation, the U. S. Department of Agriculture has extended the time for using labels bearing the Guarantee Legend. It is, of course, understood that labels should no longer be printed with the statement; the ruling is based upon the prior order of discontinuance, and, therefore, the use of such labels is only lawful if they were printed prior to May 5, 1914. The decision follows: "It has been made to appear that (1) dealers in food and drugs have on hand a great many labels and containers printed or marked prior to the date of Food Inspection Decision 153 (May 5, 1914); (2) these labels and containers bear the legend "Guaranteed by (name of guarantor) under the Food and Drugs Act, June, 30, 1906," or a serial number issued by the United States Department of Agriculture, or both; (3) these labels and containers, when so printed or marked, complied with the Rules and Regulations for the Enforcement of the Food and Drugs Act in effect at the time; and (4) great financial loss will result to such dealers, through their inability to use these labels and containers, if Regulation 9, as amended by Food Inspection Decisions 153 and 155, be enforced beginning on May 1, 1916.

"Accordingly, proceedings under the Food and Drugs Act, based on the shipment in interstate or foreign commerce, or the sale in the District of Columbia or the Territories, prior to May 1, 1918, of any article of food or drugs, will not be instituted solely on account of the fact that the label thereon or the container thereof bears the legend 'Guaranteed by (name of guarantor) under the Food and Drugs Act, June 30, 1906,' or a serial number issued by the United States Department of Agriculture, or both, upon it being established that such label or container was so printed or marked prior to May 5, 1914."

ORDERS FOR PREPARATIONS CONTAINING NARCOTICS NEED NOT BEAR STATEMENT OF AMOUNT OF NARCOTIC CONTAINED.

Treasury Decision 2,323 has been issued pursuant to hearings given representatives of the drug trade in which the claim was made that it would be practically impossible for druggists placing orders for preparations and remedies containing the narcotic drugs in question to state what amount of the proscribed drugs was contained in a particular order.

The Decision follows: "The ruling contained in Treasury Decision 2,292, amending Treasury Decision 2,244, requiring the narcotic content of preparations and remedies in grains to the fluid or avoirdupois ounce, or the quantity of narcotic drug in grains or fractions thereof, contained in a tablet or pill, to be indicated on official narcotic order forms, is hereby revoked, to take effect immediately.

"Hereafter the name of the preparation, the quantity in ounces, if in liquid form, or if in tablet, pill, ampule or suppository form, the units or total thereof, and the name of the particular narcotic drug contained in such preparations, tablets, pills, ampules or suppositories, need only be entered on these order forms."

The new plan is to be given a thorough test by government officials and if found not workable some other plan must be devised. Representatives of the drug trade have offered to place in the hands of the government officials full lists of the various preparations and remedies containing the proscribed drugs

in the non-excepted quantities, so inspectors will have no difficulty in computing the quantities of narcotic drugs contained in each order.

MARYLAND PROVIDES FOR PHARMACEUTICAL USES OF ALCOHOL.

A law for correcting the State-wide prohibition bill of Maryland has been signed by the Governor, and permits the use of alcohol for certain purposes. It reads: "An act to regulate the manufacture, purchase, sale or dealing in medicinal, pharmaceutical, scientific, sacramental, mechanical, culinary, or toilet preparations.

"Section 1. Be it enacted by the General Assembly of Maryland that it shall not be unlawful to manufacture, buy, or deal in any medicinal, pharmaceutical, scientific, sacramental, mechanical, culinary or toilet preparation which may contain such percentage of alcohol as may be necessary to hold the contents in solution, preserve the preparation or keep it from freezing; provided, however, that no such preparation shall be manufactured, bought, sold or dealt in, for use as a beverage or intoxicant.

"Section 2. And be it further enacted, that any and all laws in conflict therewith are, to the extent of such conflict, hereby repealed.

"Section 3. And be it enacted that this act shall take effect from June 1."

PARK COMPANY'S DAMAGE SUIT FORMALLY DISMISSED IN NEW YORK COURT.

Though it is still considered possible, if not probable, that the John D. Park & Son Company, of Cincinnati, will carry its long-drawn-out injunction and damage suit against numerous prominent wholesale druggists to the United States Circuit Court of Appeals, this case has now been thoroughly adjudicated and wound up, as far as the United States District Court in New York is concerned. By a decision made by Judge Julius M. Mayer, in the District Court, an amended complaint of the Park Company has been held to be barred by the defendants' plea that the statute of limitations has operated against that concern's claim for damages sustained by alleged "conspiracy and combinations in restraint of trade" acts on the part of the defendants from 1889 to 1902.

PRICE MAINTENANCE VERDICT.

The jury sitting in the case of Frey & Son, Inc., wholesale grocers of Baltimore, against the Welch Grape Juice Company, an action for damages on the ground that the Welch Company had refused to let the grocery company have goods because the grocery company had declined to sign an agreement to keep up the producers' price, brought in a verdict for the Welch Company on April 27th in the United States Court. Frey & Son, Inc., had sued for $20,000, punitive damages being put at four times this sum.

CHARLES E. HIRES COMPANY SECURES VERDICTS.

Several suits, charging substitution in sales and dispensing of substitute products for Hires' Root Beer, have been decided in favor of Charles E. Hires Company, and the defendants adjudged guilty.

WAR DEPARTMENT.

List of changes of station covering period ending April 30, 1916, in the cases of Sergeants First Class and Sergeants, Hospital Corps, U. S. Army.

SERGEANTS FIRST CLASS.

Rush O. Day, from Ft. D. A. Russell, to the Southern Department.

James Sweeney, from Ft. Sam Houston, to Ft. Bliss.

William J. Murphy, from the U. S. Disciplinary Barracks, Alcatraz, to Ft. Bliss.

Thomas G. Bristow, from Field Hospital No. 2, to the U. S. Disciplinary Barracks, Alcatraz, Cal.

William K. Lyda, from Ft. Lawton, to Ft. Bliss.

Herbert Repp, from the Letterman General Hospital, Cal., to Ft. Bliss.

James A. Tremblay, from West Point, N. Y., to Ft. Sam Houston.

Lyell R. Stewart, from Ft. Miley, to Ft. Bliss.

Alexander Berkowitz, from the Philippines Department, to the Letterman General Hospital.

Jesse H. Mael, from the Philippines Department, to Ft. Miley.

George P. Chase, from the Philippines Department, to Ft. Lawton.

James F. Hamner, from Ft. McDowell, to Alaska, on the June transport.

George J. Shull, from Ft. Thomas, to Alaska, on the June transport.

Earl F. Greene, from Jackson Barracks, to Alaska, on the June transport.

Albert Metze, from the Attending Surgeons' Office, Washington, D. C., to Alaska, on the June transport.

Paul Yeatman, from Alaska, to Ft. Lawton, for assignment, in July.

Thomas E. Albertson, from Alaska, to Ft. Lawton, for assignment, in July.

John A. Watfield, from Alaska, to Ft. Lawton, for assignment, in July.

Walter W. Tobin, from Alaska, to Ft. Lawton, for assignment, in July.

Forest E. White, from Alaska, to Ft. Lawton, for assignment, in July.

Ray Westra, from Ft. Bayard, to the Letterman General Hospital.

SERGEANTS.

John E. Oberg, from the Presidio of San Francisco, Cal., to Ft. Worden.

James J. Johnson, from Ft. Wadsworth, to Ft. Hamilton.

Edwin R. Arndt, from Ft. George Wright, to the Presidio of Monterey, Cal.

Adolf Nelson, from Ft. Wadsworth, to the Southern Department, for assignment.

Thomas O. Williams, from the Hawaiian Department, to Ft. Yellowstone.

Albert F. Dowler, from the Philippines Department, to the Letterman General Hospital.

Ralph B. Kopenhefer, from Ft. Ethan Allen, to the Southern Department, for assignment.

Brent A. Lemert, from Ft. Ethan Allen, to the Southern Department, for assignment.

Paul J. Schreiner, from Ft. Totten, to the Southern Department, for assignment.

George D. Coleman, from Ft. Andrews, to the Southern Department, for assignment.

Horace J. Caterer, from the U. S. M. P. "Mills," to Ft. Jay.

UNITED STATES PUBLIC HEALTH SERVICE.

Pharmacist T. V. O'Gorman, directed to proceed to Port Townsend, Washington, for duty at Quarantine Station.

April 21, 1916.

Pharmacist F. J. Hurley, relieved at Marine Hospital, San Francisco, California, and proceed to Angel Island Quarantine Station.

April 19, 1916.

Pharmacist R. F. Troxler, relieved at the Angel Island Quarantine Station, and proceed to the Marine Hospital, San Francisco, California. April 19, 1916.

Scientific Assistant W. J. Lauck, proceed to Spartanburg, S. C., for duty in investigations of pellagra. April 20, 1916.

Sanitary Engineer Walter G. Stromquist, proceed to Cincinnati for duty in studies of stream pollution. April 19, 1916.

Sanitary Engineer Herbert H. Wagenhals, proceed to Cincinnati for duty in studies of stream pollution. April 19, 1916.

Pharmacist F. L. Brown, granted 1 day's leave of absence, April 3, 1916.

April 1, 1916.

Pharmacist J. V. La Grange, granted 2 days' leave of absence, March 27 and 31, 1916.

March 27, 1916.

RUPERT BLUE, *Surgeon General.*

CHANGES OF ADDRESS.

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

ARMSTRONG, THOS. C.
From 80 River St., Cambridge, Mass.
To U. S. Marine Hospital, Chelsea, Mass.

CZYZEWSKI, B. J.
From 1102 Washington Ave., Braddock, Pa.
To 1100 Washington Ave., Braddock, Pa.

KOLBE, E. B.
From 671 Junction Ave., Detroit, Mich.
To 681 Dix Ave., Detroit, Mich.

NOAKS, RICHARD S.
From National Cemetery, Va.
To Hopewell, Va., Box 661.

KAUFFMAN, GEO. B.
From 235 N. High St., Columbus, Ohio.
To Care of The Kauffman Lattimer Co., Columbus, Ohio.

SMITH, GUY L.
From Front St., Douglas, Alaska.
To Guy's Drug Store, Opposite Post Office, Douglas, Alaska.

BRADT, F. T.
From 171 Blaine Ave., Detroit, Mich.
To 399 Vinewood Ave., Detroit, Mich.

CHURGIN, JOS. S.
From 210th St. and Gunn Hill Road, New York, N. Y.
To 1646 Park Place, Brooklyn, N. Y.

SIMMEL, MARTIN.
From Care of Depot Q. M. Corps, Philadelphia, Pa.
To Ft. Bayard, New Mexico.

LEWIS, HENRY.
From 509 State St., Madison, Wis.
To State and Gilman Sts., Madison, Wis.

HART, WILLIAM F.
From 11 S. Arlington Ave., East Orange N. J.
To 485 Joseville Ave., Newark, N. J.

MUELLER, OTTO E.
From 1832 Baxter Ave., Louisville, Ky.
To 970 Baxter Ave., Louisville, Ky.

MILLER, A. N.
From 306 E. 165th St., New York, N. Y.
To Residence unknown.

RAYCRAFT, J. W.
From 900 E. 4th St., Alton, Ill.
To Residence unknown.

VON KOSS, J. L.
From 32 Adams Ave. W., Detroit, Mich.
To Residence unknown.

KOERBER, CHAS. J.
From Care of Heading Drug Store, Lewistown, Pa.
To 2621 Girard Ave., Philadelphia, Pa.

HERRON, CHAS. S.
(Reinstated) and his address is Care of Burrough Bros. Manfg. Co., Baltimore, Md.

SMITH, GEO. W.
From Honolulu Territory, Hawaii.
To P. O. Box 426, Honolulu Territory, Hawaii.

HANLON, WM. T.
From Harlingen, Texas.
To Residence unknown.

ROE, ROY C.
From 709 S. Winchester Ave., Chicago, Ill.
To Residence unknown.

TRAINER, FRANK.
From Douglas, Ariz.
To Residence unknown.

GRASSLY, CHAS. W.
From 802 W. 12th St., Chicago, Ill.
To 4601 N. Western Ave., cor. Wilson, Chicago, Ill.

BREWERS' YEAST AS A SOURCE OF VITAMINES.

A recent report by Mr. Atherton Seidell, of the Hygienic Laboratory, U. S. Public Health Service, describes a successful process of obtaining a cheap and stable vitamine, in concentrated form, for use in treating nutritional deficiency diseases, such as beriberi, pellagra, etc. The preparation is obtained from brewers' yeast, which is pressed, autolyzed by keeping at a temperature of about 100° F. for 48 hours, and filtered through paper, the filtrate then being treated with Lloyd's colloidal hydrous aluminium silicate reagent. Finally, a solid residue is obtained by siphoning, desiccation, etc. The preparation has been given to pigeons in doses of 0.05 Gm. on alternate days, and the pigeons were thus enabled to retain normal health and weight on an exclusive diet of polished rice, which would otherwise produce fatal polyneuritis. Completely paralyzed pigeons have also been promptly cured by this new remedial agent.

A NEW ANTISEPTIC.

Some notes on a new antiseptic were contained in a recent issue of the *British Medical Journal*, that has been named chloramine. Therein it is stated that chloramine is most conveniently produced by adding sodium hypochlorite to toluene sulphonamide, and is a colorless, crystalline substance, which, in the solid form, is quite stable. When dissolved in water it can be kept unchanged for several months. It is without corrosive action, is non-toxic and does not coagulate protein. Its germicidal action is, according to the same authority, molecule for molecule, about four times that of sodium hypochlorite, and it is less irritating and can be used in concentration five or ten times as great.

JOURNAL ANNOUNCEMENTS.

Subscriptions: Annual subscriptions in advance, including postage: United States and Mexico, $4.00; Canada, $4.35; foreign countries, $4.50. Single copies, 35 cents. Remittances should be made payable to Treasurer H. M. Whelpley, but mailed to Journal of the American Pharmaceutical Association, 253 Bourse Building, Philadelphia, Pa. Under the rules of the Post Office the Journal can be regularly mailed only to bona-fide paid subscribers.

Requests for Back and Missing Numbers: Requests for back and missing numbers should be sent to the Editor. Claims will not be allowed if sufficient notice has not been given of change of address, and in no case if received later than sixty days from date of issue. Notice of change of address should give old and new address.

Contributions: The Journal accepts no responsibility for the opinion of its contributors. Contributions should be sent to the Editor; use only one side of the sheet for writing, and double-space the lines. Articles are accepted for publication on condition that they are contributed solely to this Journal; and "all papers presented to the Association and its Branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by consent of the Committee on Publication." (By-Laws, Chapter X, Article 11.)

Reprints: Authors may obtain reprints of the J. B. Lippincott Company, Philadelphia, Pa., at the prices attached to the proof sent them, provided the order is received before the type has been distributed. The prices are also given on this page.

Advertisements: Communications relating to advertising should be sent to the Editor. Forms close on the first of each month, and copy should be in by the fifteenth of the month preceding date of issue, to receive proof. Date of issue—the fifteenth of the month. Advertising rates sent on request.

Membership: Applications for membership in the American Pharmaceutical Association may be made of any of the officials. The annual payment of five dollars covers the annual dues and subscription to the Journal. Members receive, also, the publications of the Association that are distributed free of charge.

Further information will gladly be furnished by any of the officers of the Association and members.

Cost of Reprints: Reprints will be furnished at the following prices:

	No cover.	With cover.
100 copies, 4 pages ..	$2.50	$4.50
200 copies, 4 pages ..	3.00	5.50
50 copies, 8 pages ..	2.75	4.50
100 copies, 8 pages ..	3.50	5.00
200 copies, 8 pages ..	4.50	6.50
50 copies, 12 pages ..	3.75	4.75
100 copies, 12 pages ..	4.75	5.75
200 copies, 12 pages ..	5.75	6.75
100 copies, 16 pages ..	6.75	7.75
200 copies, 16 pages ..	7.50	8.50

Orders may be sent to J. B. Lippincott Company or Journal of the American Pharmaceutical Association, 253 Bourse Building, Philadelphia, Pa.

REQUEST FOR BACK NUMBERS OF THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The American Pharmaceutical Association would be pleased to receive back numbers of the JOURNAL. There are some who have duplicate copies, and their consideration would supply the wants of others. The JOURNALS should be addressed to THE JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 253 Bourse Building, Philadelphia, Pa. Only the following numbers are desired:

1912	1914	1915	1916
April	August	January	January
May	September		February
	October		March
			April